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# FOOT AND MOUTH DISEASE GUIDELINES FOR ERADICATION

Prepared by  
Veterinary Services

Animal and Plant  
Health Inspection Service  
UNITED STATES  
DEPARTMENT OF AGRICULTURE

Hyattsville, Md

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## FOREWORD

The purpose of this manual is to outline the responsibilities of the State and Federal animal disease control officials and prescribe general and specific procedures for handling outbreaks of foot-and-mouth disease.

The most important single responsibility is being prepared to act swiftly and effectively to eradicate foot-and-mouth disease outbreaks which threaten the livestock resources of this country. This responsibility can be met only through cooperative planning for effective utilization of the combined resources available to State and Federal officials.

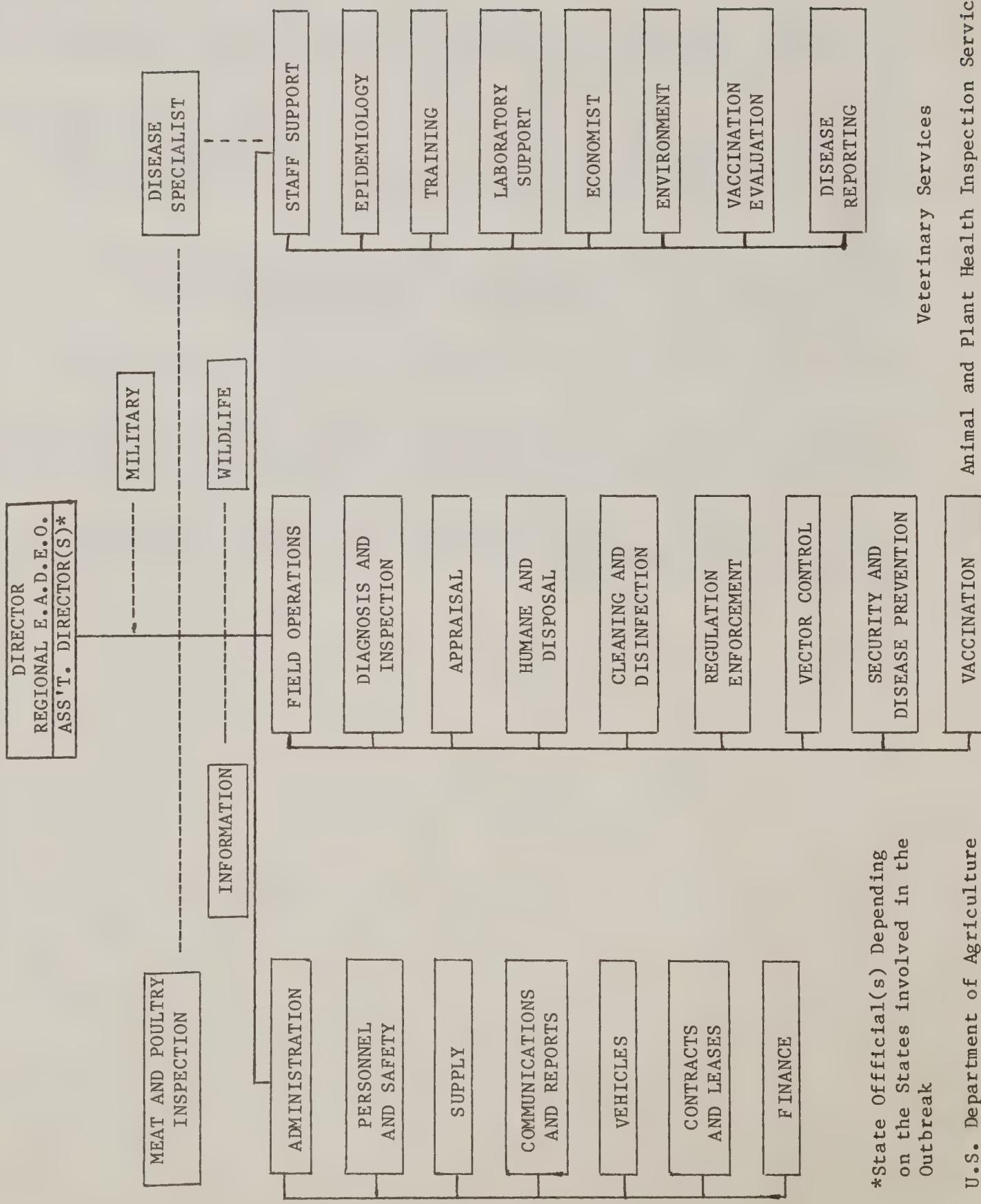
This manual, presented as a guide in conducting foot-and-mouth disease eradication operations, is not intended to prevent, to limit, or to discourage deviations to be made when conditions warrant.

Since the turn of the century, foot-and-mouth disease has been eradicated six times in the United States, with the last outbreak occurring in 1929.

This book is dedicated to the veterinarians of the past who, with knowledge and foresight, recognized the necessity of maintaining the United States livestock industry free from devastating foreign animal diseases and to the veterinarians of the future seeking to maintain the integrity of this philosophy.

Figure 1 and Figure 2 show the organizational structure of the Regional Emergency Animal Disease Eradication Organization (READEO) and the Veterinary Services Regions.

REGIONAL EMERGENCY ANIMAL DISEASE ERADICATION ORGANIZATION



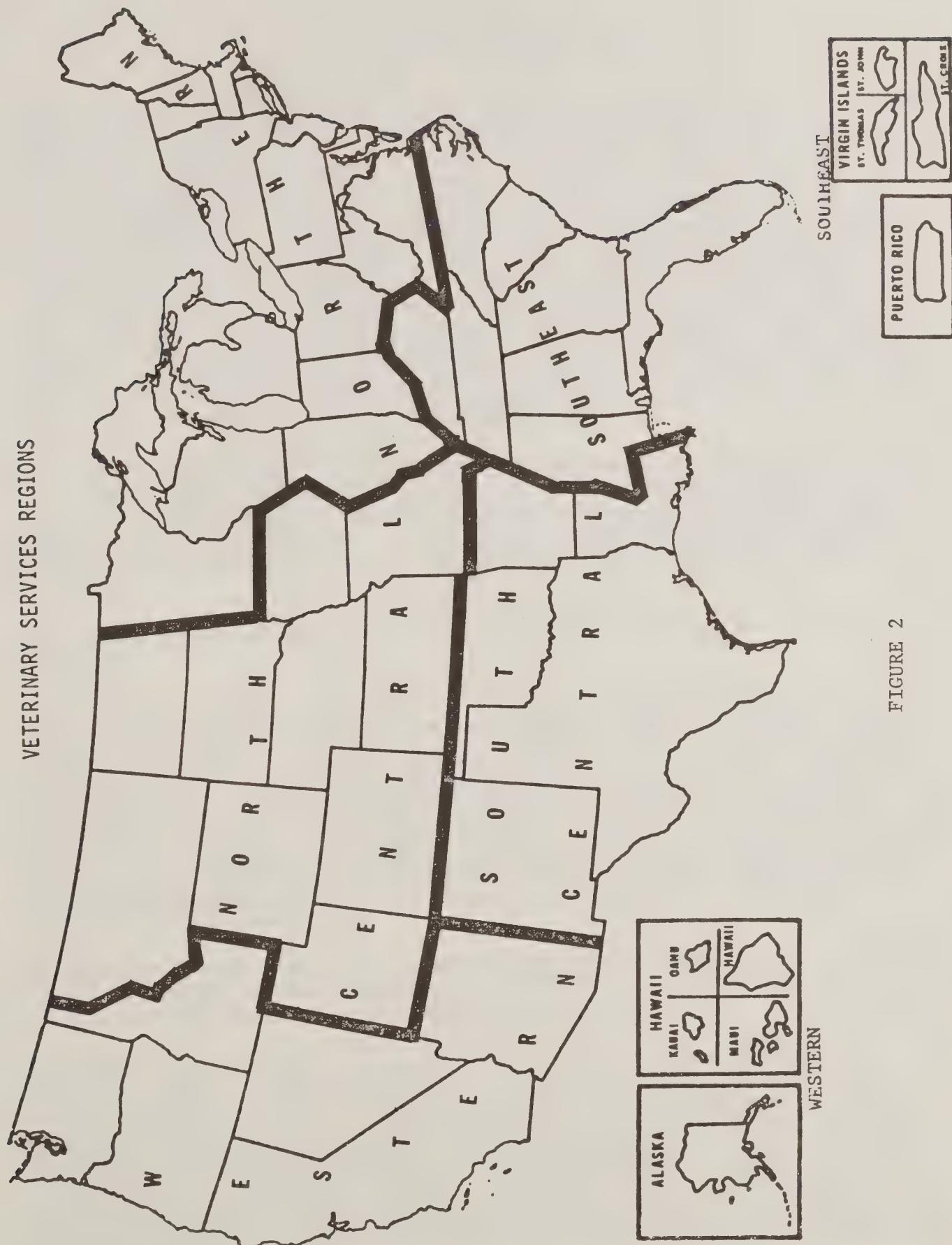
\*State Official(s) Depending  
on the States involved in the  
Outbreak

U.S. Department of Agriculture

VACCINATION

Animal and Plant Health Inspection Service

Veterinary Services





## FOOT-AND-MOUTH DISEASE REVIEW

Foot-and-mouth disease (FMD) is a contagious, viral infection of cattle, swine, sheep, goats, deer, and other cloven-hoofed animals. There are seven types of FMD virus--A, O, C, SAT-1, SAT-2, SAT-3, and Asia-1. Within the seven types, there are at least 61 subtypes. Severity of signs and lesions is often related to the type or strain of virus. Lesions usually begin as vesicles and may be found on the tongue, dental pad, gums, cheeks, hard and soft palate, lips, nostrils, muzzle, snout of pigs, coronary band, corium of dewclaws, interdigital space, teats, udder, and rumen pillars. These rupture, leaving raw eroded areas. The vesicular fluid contains high concentrations of FMD virus and, therefore, is highly infectious to susceptible animals. Degeneration may occur in myocardium and skeletal muscles. Vesicular diseases which resemble FMD are: vesicular stomatitis (VS), vesicular exanthema of swine (VES), and swine vesicular disease (SVD). These diseases can be distinguished from each other only by animal inoculation and laboratory tests.

The classical signs are salivation and lameness caused by the formation of blisters in the mouth and on the feet. The disease may produce fever, dullness, inappetence, loss of weight, decreased production, shivering, tremors, smacking of lips, drooling of viscous saliva, nasal discharge, kicking of feet, lameness, and abortion. Mortality in suckling pigs or lambs may approach 75 percent.

The usual incubation period is 3-5 days although longer periods have been reported.

Pathogenesis of FMD is in the following order: inhalation or ingestion of virus; infection and replication in throat area; spread of virus to blood and lymph; fever; infection of lymph nodes; infection of cells at the sites of lesion development; presence of virus in body fluid; appearance of vesicles; salivation, nasal discharge, lameness; rupture of vesicles and increased clinical signs; end of fever; end of viremia and start of detectable antibody production; decline of virus titer in various tissues and fluids; healing of lesions and resumption of eating; gradual disappearance of virus except from the throat (nasopharynx) area where the virus may persist indefinitely resulting in a carrier state.

Animals may develop chronic secondary infection with resulting damage such as hoof deformation, chronic mastitis, low milk yield, unthriftiness, heart damage, abnormal estrus, infertility, and diabetes mellitus.

Transmission is most often via respiratory aerosols to animals in close proximity. Over long distances, virus is usually carried by preclinical incubating animals, fomites, or in meat from infected animals. Garbage containing uncooked meat scraps fed to swine is especially dangerous. People may inhale and harbor the virus in the upper respiratory tract for at least 24 hours and may transmit virus to other people or animals. Transmission may be by ingestion of contaminated foods, by licking contaminated objects, inhalation of virus laden aerosols and airborne particles, and by abrasion of the mucous membranes or skin.







1.  $\frac{1}{2} \sin 2\theta = \frac{1}{2} \sin 2\theta$



## SECTION I--INVESTIGATING SUSPECT CASES

### PART A--Procedures for Investigation (No known case in U.S.)

#### 1. Initial Report and Investigation

When a vesicular disease is suspected, the State and Federal veterinarians in charge should be notified and a field investigation should be promptly conducted by a foreign animal disease (FAD) diagnostician. However, if the investigation is not conducted by a FAD diagnostician and the condition found is clearly not a vesicular disease or any other foreign animal disease, no further action will be required except a full written report of the case should be furnished Emergency Programs (EP) of Veterinary Services within 5 working days whether investigated by a FAD diagnostician or other veterinarian. This report should include (1) the name, telephone number, and address of the owner, (2) the name, telephone number, and address of the person initially reporting the disease, (3) the location of the premises, (4) the species and number of the animals on the premises, (5) the species and number of animals affected, (6) a description of the symptoms and lesions, including losses, (7) conclusions reached as to the cause and the nature of the condition, (8) name and address of any laboratory receiving specimens, and (9) the date when the investigative actions were performed.

#### 2. Request for Investigation by a Foreign Animal Disease Diagnostician

When the initial investigation discloses evidence of FMD, a specially trained foreign animal disease diagnostician should be promptly assigned to the case. The diagnostician should be contacted in the most expeditious manner possible. Any diagnostician contacted directly should advise his supervisor or other responsible official at his home station of his assignment. If any problem in securing the services of a diagnostician is encountered, the appropriate Regional Director or Emergency Programs (EP) may be contacted by phone for assistance.

Immediately after the diagnostician is contacted, the veterinarian in charge of the field station should communicate by telephone with the appropriate Regional Director or EP and give the history, signs, and circumstances leading to the action he has taken, the diagnostician assigned, and the measures initiated by the State. Until the possibility of FMD has been eliminated, animal movements to or from the premises involved should be prohibited and movements of personnel and materials that might spread the virus should be restricted.

#### 3. Diagnostician's Responsibilities

The FAD Diagnostician should proceed as rapidly as possible to the designated premises and investigate the suspected disease condition. He should carry all necessary supplies and equipment to examine suspicious animals and collect and package the necessary laboratory specimens. The diagnostician should promptly inform EP and Federal and State officials of findings on the farm. The Federal veterinarian in charge should promptly notify the appropriate Regional Director. Decisions regarding quarantine and collection of laboratory specimens and method of shipment can often be expedited by phone conversations between the diagnostician, EP, and the State or Federal officials in charge.







## PART B--DIAGNOSIS

1. Laboratory Tests

Laboratory tests will be conducted at the Plum Island Animal Disease Center (PIADC) or other laboratories designated by EP.

2. Notification

Diagnosticicians should call EP and the Area Veterinarian in Charge (AVIC) as soon as an assessment of the disease condition is made on the farm. It is imperative that all supervisory levels be constantly kept informed of the disease situation as it develops. The State Animal Health official will be informed by the Area Veterinarian in Charge.

Emergency Programs will advise the diagnostician regarding collection and submission of diagnostic specimens. In some situations a courier will carry the specimens to the laboratory, in other instances arrangements for special package handling such as counter-to-counter service will suffice. If submissions are to be made to PIADC, the Director of PIADC will be immediately notified by EP. If specimens are to be collected, the Federal and State official in charge should promptly make arrangements to get the specimens to the laboratory, i.e., reservations for courier or determine which flights would be most expedient.

All foreign animal disease specimen submissions require approval of the EP Director or authorized representative. In addition, EP should be notified of (1) the airline, (2) origin of flight number, (3) the flight number, (4) the waybill number, and (5) expected arrival time, date, and name of the courier if utilized.

3. Selection of Specimens

a. Tissue or vesicular fluid for virus isolation. Animals with lesions and/or fever are most likely to yield virus. Each animal sampled should be individually identified. Vesicular fluid should be aspirated with a syringe and needle and placed in a vial. Care should be taken during collection since vesicular fluid is under pressure and the epithelium covering is friable. Vesicular fluid contains the highest concentration of virus of any tissue or fluid in the animal's body. Also harvest vesicular covering from unruptured or freshly ruptured vesicles. When lesions are covered with mud or debris, clean with clear water before harvesting specimens.

When vesicular material is not available, every effort should be made to harvest tissue from the periphery as well as the crater of the lesion. Use small scissors or scalpel to trim material from the periphery or, if necessary, scrape the area, or several lesion areas, to obtain sufficient material for a diagnostic test. If necessary, consideration should be given to buying the animal so that sufficient material may be obtained (using an over-the-counter purchase order).

In such cases, it may be necessary to sacrifice the animal and excise the entire lesion. Include apparently normal tissue adjacent to the lesion. A followup investigation may be necessary to follow the course of the disease and collect further specimens for submission to the laboratory.

b. Whole blood for virus isolation. Whole blood without anticoagulants may be used for virus isolation, although the virus concentration is usually much higher in the vesicular epithelium covering the vesicle. It has been found that FMD virus may be isolated from blood collected during the acute stages and especially the febrile stages (104°-106°F.) of the disease. Whole blood should be held and shipped chilled or frozen.

c. Sera for serology. Two 10 ml blood samples should be collected from each animal suspected to be infected and from convalescent or recovered animals during the initial investigation. Aseptically separate the clot from the serum and discard clot. Seal the serum container securely to prevent leakage and wrap securely with plastic tape. Refrigerate or freeze the serum until time to ship, and ship with prefrozen coolant packs. Tubes should be only half filled and frozen in a slanted position. A second set of serum samples may be needed 2 to 3 weeks later from the same animals, therefore, it is imperative to individually identify the animal from which serum was collected. If at the time of the initial investigation, it is determined that 2 to 3 weeks have already elapsed since any animal was in the acute stage, the second set of serum may not be necessary.

d. Procedures for collecting probang specimens from bovines and from small ruminants. Three sizes of probangs are available for collecting esophageal pharyngeal (OP) fluid and epithelium from large and small ruminants. The cup is inserted into the OP region to collect saliva, mucous, and tissue which may contain foot-and-mouth disease (FMD) virus. The virus of FMD can become established in the surface epithelium of the pharyngeal region and may be detected for long periods. This can occur without the development of clinical signs in vaccinated animals exposed to virus and in some susceptible animals exposed to very small quantities of virus. The latter animals may or may not be serologically positive.

The virus may persist for varying periods of time after the initial infection, giving rise to the carrier state. A substantial proportion of the animals, either susceptible or vaccinated can become carriers and virus may be recovered from OP samples that are collected several weeks or even months after exposure to FMD virus.

(1) Technique for collecting probang specimens from cattle:

(a) The animal should be well restrained, preferably in a chute. Nose tongs may or may not be used, depending upon the docility of the animal. The head of the animal should be held in a straightforward position and slightly elevated. With docile animals, an assistant may stand to the animal's right side, restrain the animal, and elevate the head with his left arm. The operator should stand slightly to the other side of the animal's head.

(b) The probang cup should be inserted into the left side of the animal's mouth and pushed over the dorsal prominence (hump) of the tongue; with gentle pressure, the animal will swallow the cup. The cup should be allowed to pass into the esophagus, and by moving it back and forth it can be seen or palpated along the side of the neck, assuring that the cup is in the esophagus and not in the trachea. The cup should be moved back and forth in the esophageal-pharyngeal region with some vigor five or six times.

(c) The cup may be withdrawn with a firm, steady pressure, resulting in little or no injury to the animal. As the cup is withdrawn, care should be taken to keep the cup in an upright position to prevent spillage.

(d) Many animals have a dryness of their mouth and throat when excited. This will influence the amount of material collected with each passage of the probang, which may average 3 ml when the cattle are not greatly excited. Flushing the mouth with water prior to and between probang passages does not reduce the chances for isolation of virus from the samples. Saliva per se is not what is wanted in the sample, since it usually contains very little virus. The desquamated epithelial cells and mucous of the pharyngeal and upper esophageal regions is the material most likely to contain virus. This material is loosened and collected in the cup by the movement of the probang. Saliva and residual water from the mouth mainly serve as the suspending vehicle for the cells and mucous and make it easier to pour the samples out of the cup. The probang should not be used in such a way that hemorrhages are produced, since blood in the sample is undesirable. If the animal regurgitates or if excessive food material is contained in a sample, the sample should be held separately, the animal's mouth flushed with water, and an attempt made to collect additional cleaner samples. Retain the initial sample if the quality of subsequent samples does not improve. Usually, the minimum collection of 10 ml or more of OP fluid can be obtained by three passages of the probang. It is generally not desirable to exceed three passages of the probang because the irritation may result in bloody specimens.

(e) Preserve the virus with addition of tris buffered tryptose broth (TBTB). It contains an indicator dye to assure correct pH; i.e. purple indicates alkaline, red is neutral, and orange to yellow is acid. When TBTB is added to the specimen, the resulting color should be red to slightly purple. Care must be taken to prevent bacterial contamination of TBTB since it is also an excellent medium for bacterial growth. To prevent bacterial growth, it is essential to chill or freeze the specimen immediately upon mixing with the broth.

(f) (1) After each passage of the probang, the material collected should be poured into the container until 10 ml or more of sample has been obtained. Immediately after obtaining the desired amount of OP fluid an equal volume of diluent should be added and the specimen container vigorously shaken for a minute. The resulting color should be red to slightly purple. If, when shaken, the specimen has a yellow color it may indicate that the rinse water is too acid. Further collections then should be made utilizing another source of more neutral water. Likewise, if the water is too alkaline, use

another source. (2) If the material in the probang cup is so thick and tenacious that it will not pour, a measured amount of diluent may be placed in the cup and stirred with a clean large gauge needle until the sample can be poured into the container. The amount of diluent added should not exceed the volume of specimen material. Thick tenacious material indicates that the animal's mouth and throat are too dry. Rinse the animal's mouth before the next probang passage. (3) Do not attempt to take probang samples from young calves or small ruminants with the regular-size cattle probang. Use the smaller probang.

(g) The probang may be disinfected between animals with 2 percent acetic acid, or vinegar, or 2 percent sodium hydroxide. However, a small amount of residual disinfectant destroys any virus present in the OP sample, therefore, special precaution must be exercised to assure that the probang is thoroughly rinsed with clean water after disinfection and before reuse.

(2) Technique for collecting probang specimens from small ruminants:

The probang for small ruminants is different. This probang has two small cups with the concave surfaces facing each other. Careful examination reveals the diameter of the top cup is slightly larger than the bottom cup. This facilitates collection of OP tissue and fluids on the downward stroke of the probang. The smooth convex surface of the top cup prevents the instrument from cutting or damaging the tissues.

(a) The animal must be well restrained. An assistant may straddle the animal's neck and grasp one jaw in each hand forcing open the mouth.

(b) The operator should face the animal and insert the probang directly down the center of the tongue to the dorsal prominence (hump). With gentle pressure against the dorsal prominence, the animal will swallow the probang. The probang should be moved back and forth in the esophageal-pharyngeal region with vigor five or six times. Tests in sheep have shown that the highest concentration of the virus is in the tonsillar region.

(c) The probang may be withdrawn with a firm steady pressure. If difficulty is encountered in removing the probang, pull gently until the animal stops swallowing and releases the cup.

(d) The amount of material collected from small ruminants will be much less than OP fluids collected from bovines (2 ml or less per passage). The probang should be passed at least 3 or 4 times and the material collected placed in approximately 5.0 ml or equal volume of diluent.

(e) Each collection should be immediately transferred to the sample container. This may be accomplished in either of two ways: Place the cup in the container of diluent and agitate, or use a syringe to flush the material from the probang cup into the container.

(3) Probang procedures are not necessary for swine.

Do not fill vials more than half full. The diagnostician may keep some material (if sufficient material is available) buffered and frozen or refrigerated for reference if needed. The diagnostician will be responsible for proper disposition of any unused specimen material.

Seal vials with moisture repelling tape or sealing wax to prevent leakage.

Label vials properly. Each vial should be numbered and the number of each vial and the contents listed on the accompanying laboratory submission form. A separate submission form should be submitted for each owner or premises. Identity of each specimen with each animal should be correlated. Include owner's name and address, species, date of harvest, and type of material. Use water resistant ink or waterproof labels. Avoid the use of wax pens as cooling and condensation has a tendency to remove the wax.

Individually wrap each vial in sufficient absorbent cotton to assure absorption of all fluids in event of breakage and place in individual plastic bags.

Place protected vial or vials in a rigid secondary container such as an unused paint can usually provided with the specimen shipping carton.

Include with the specimen two copies of completed submission forms. One copy is put inside the shipping container and accompanies the specimens into the testing area of the laboratory. The other copy is placed inside the outer flap of the shipping container and removed before the specimen is unpacked inside the laboratory.

During all stages of packing, the material should be kept chilled or frozen. Place specimen containers in shipping container, with prefrozen coolant. All contaminated areas should be sponged with disinfectant. The material should be transported in the most expedient manner feasible to the laboratory. Final plans and methods for shipment to the laboratory will be decided when EP is contacted.

4. Collection and Submission of Vesicular Disease Specimens

The packaged specimens may be couriered or shipped via the special handling service provided by most airlines. The laboratory director will make the necessary arrangements to expediently get the specimens from the airport to the laboratory.

a. If the test samples will arrive at the laboratory in less than 24 hours from the time of collection; vesicular fluid, vesicular tissue, and OP fluid may be sent refrigerated provided sufficient frozen gel packs (at least six) are used in packing.

(1) Vesicular fluid - fresh, do not dilute.

(2) Vesicular tissue - fresh, do not dilute.

(3) OP fluid - dilute in an equal volume of either TBTB or a tissue culture media such as Hanks solution pH 7.5 containing a pH indicator. (To prevent leakage, all caps must be tightened and taped closed).

(4) 10 ml of whole blood. (No anticoagulant).

(5) 10 ml of serum or 20 ml of clotted whole blood.

b. If it will take more than 24 hours for the test samples to arrive at the laboratory after the time of collection, the samples shall be preserved as follows:

(1) Vesicular fluid - undiluted - frozen with dry ice.

(2) Vesicular tissue - and sufficient buffered glycerine to cover tissue - ice packs.

(3) OP fluid - dilute in an equal volume of either TBTB or a tissue culture media such as Hanks solution (caps must be tightened and taped closed) - frozen with dry ice.

(4) 10 ml of whole blood - ice packs.

(5) 10 ml of serum - frozen with dry ice.

It may be advisable to consult directly with the laboratory on a case-by-case basis.

##### 5. Address of Plum Island Animal Disease Center

Plum Island Animal Disease Center  
P.O. Box 848  
Greenport, L.I., NY 11944  
Telephone: Area Code (516) 323-2500

##### Address of National Veterinary Services Laboratories

National Veterinary Services Laboratories  
P.O. Box 844  
Ames, IA 50010  
Telephone: Area Code (515) 232-0250 — FTS 862-8111

6. Diagnosis by Animal Inoculation. This method must be approved by the Director, EP, prior to use.

If it is necessary to make animal inoculations for a differential diagnosis, they should be made on the premises where the disease is found. When the test is being conducted in an area where one of the diseases being differentiated may be endemic, caution should be taken in selecting diagnostic animals to guard against the use of possibly exposed and therefore immune animals. The diagnostic animals should be brought from an area that is a considerable distance (100 miles or more depending on history of disease conditions at source) from the location of the case under investigation. The animals for the test must include a minimum of two each of the species susceptible to the diseases being differentiated.

7. Policy for Procurement and Disposal of Diagnostic Animals

In some cases, it may be desirable to arrange for obtaining diagnostic animals. Preferably, the State officials will arrange for the procurement of diagnostic animals, since in many instances, State officials can handle matters of this nature more effectively than the Federal Government. If it is not possible for the State to procure the diagnostic animals, the Federal Government can arrange for their purchase. (See Administrative Section).







## PART C--Activating READEO's and Quarantining

As soon as FMD is strongly suspected, members of all five READEO's will be alerted. When FMD is diagnosed anywhere in the United States, READEO's in the regions where the disease is found will be activated. In other regions, the directors and possibly other members of other READEO's will be relieved of all other responsibilities to ensure the most rapid tracing and investigations of animal and product movements possible. Therefore, communication between regions will be READEO to READEO with each director responsible for communication with their respective State and Federal Animal Health officials.

Quarantines are among the most effective measures for stopping the spread of livestock diseases since movement of inapparent infected carriers is usually the largest single cause of new outbreaks.

### 1. Authority to Quarantine

State and Federal regulatory officials have authority to impose quarantines or hold orders. Generally, State quarantines are imposed on individual herds and premises when any foreign animal disease is suspected. Federal quarantines are generally used to stop interstate movement of diseased livestock and State quarantines are generally used to control intrastate movements, but both Federal and State quarantines may be used simultaneously.

### 2. Suspected Premises Quarantine or Hold Order

When FMD or other foreign animal disease is suspected, the investigating veterinarian should immediately make a judgment regarding issuance of quarantines or hold orders. Failure to stop movement of infected and exposed animals may allow extensive spread in a very short time. A high degree of professional judgment is often required to make sure the quarantine is not overly restrictive and to remove the quarantine as soon as prudent. A quarantine for 3 to 6 days seldom causes serious problems and will usually be readily accepted and understood by owners.

### 3. Infected Premises Quarantine

When FMD is confirmed, the premises must be quarantined; or if previously quarantined, the quarantine must be amended to show the specific disease involved. Police or other guard measures should be instituted to ensure night and day compliance with the terms of the quarantine until slaughter and disposal of the animals are completed and the contaminated portions of the premises have received a thorough soaking with an approved disinfectant. The disinfectant of choice may be influenced by State and Federal regulations. All contaminated portions of the premises must be soaked with a permitted disinfectant prior to cleaning as directed by the C&D Officer. For the first 7 days following disposal and preliminary disinfection, movements from the premises shall be limited to that necessary to carry out emergency operations.

#### 4. Establishment of Quarantine Area

The quarantine area is a geographical area encompassing the quarantine zone and the high-risk zone. As soon as the first case of FMD is confirmed, every effort should be made to stop the movement of all susceptible livestock from and within a large area, usually one or more entire States, until the extent and distributions of the outbreak can be determined. Both State and Federal quarantines will be required.

After 7 to 14 days and movements of all possibly exposed animals have been traced, the size of the quarantined area may be reduced to an area with a radius of 10 to 25 miles from the infection (or other distance as determined necessary), depending on the extent of infection. Natural barriers and readily recognizable landmarks such as rivers, roads, and major highways, should be considered when the perimeter of this area is being established. For further surveillance, control, and eradication, the quarantined area will be subdivided into two zones. The high-risk zone will extend 3 to 5 miles beyond all known infected herds. The quarantine zone will extend from the periphery of the high-risk zone to the outer perimeter of the quarantined area.

If the infection spreads, the quarantine area must be enlarged; as areas become free from infection, the area may be reduced. The quarantine area should be clearly outlined and information concerning its location should be publicized. Quarantine signs should be posted in conspicuous places around the area.

#### 5. Procedures of Inspection for Quarantine Area

All animals in each zone should be inspected as rapidly as possible to determine the extent of the disease outbreak. The following procedures of inspection should be observed:

a. Inspections within a high-risk zone shall be made by a veterinarian unless otherwise authorized. A veterinarian assigned to a sector in the high-risk zone of the quarantine area should make daily inspections of all susceptible animals on the premises in his assigned sector. He should call on each owner, explain the reason for his visit, the location of the infected premises, the nature of the disease, and how it is spread. He should advise the owners of precautions necessary to prevent the spread of the disease and to whom the owner should report any suspicious signs. A census of all animals should be recorded on each visit. Any deviations from previous census should be fully documented and explained.

The veterinarian should observe all susceptible animals on the premises daily by walking among the animals in their normal habitat. The veterinarian should minimize direct contact with animals by using on-farm personnel to the maximum extent possible to move and handle animals. He should require those lying down to get up and move in order that he may observe any lameness, weakness, or other abnormalities. Those animals showing suspicious signs should be restrained and a careful physical examination made covering matters such as: (1) temperature, (2) mucous membranes, (3) buccal cavity and nares, (4) feet, (5) teats and udders, (6) salivation, (7) lacrimation, and (8)

general attitude. All abnormalities should be recorded. Caution should be exercised to prevent damage to the mucous membranes. Suspicious cases must be reported immediately to the READEO Diagnosis and Inspection Officer and specimens must be collected for laboratory examination after conferring with the Diagnosis and Inspection Officer.

Daily inspections of all noninfected herds in the high-risk zone will continue for 30 days following depopulation of the last infected herd within the zone. Weekly inspections will then be conducted until the quarantine is released. The quarantine may be lifted from the area when the last infected premises is ready to be released from quarantine (120 days after cleaning and disinfection of the last infected premises) and all other eradication measures completed.

Strict sanitary measures shall be observed by inspectors working within the quarantined area. Vehicles should not be driven onto the premises unless absolutely necessary. Protective clothing or freshly laundered coveralls shall be worn for each inspection. Rubber footwear must be disinfected both on entering and leaving the premises. Each contaminated piece of equipment or clothing must be thoroughly cleaned and disinfected or sealed in plastic bags before leaving the premises. (See Section I, Part D--Supplies and Equipment for lists of protective clothing and inspection equipment). Freshly laundered coveralls and disposable head covers may be used in lieu of rubber gear. When FMD suspicious animals are found, no more premises should be visited for 48 hours. During this time, all clothing should be laundered, vehicles and all equipment cleaned and disinfected. At least two thorough baths, including washing of the hair, should be taken during the 48 hours.

b. Quarantine zone inspections should be conducted by veterinarians, however if veterinarians are not available, specially trained animal health technicians experienced in examining animals for disease signs may make the inspection.

All susceptible animals in this zone must be inspected at least two times each week. In this zone it is not necessary that the inspector get in the lot with the animals if he can observe them across the fence. If any animal has suspicious signs or lesions, a veterinary inspection shall be required. The veterinarian making such inspections should observe all animals on the premises, using the same procedure as described for high-risk zone inspection. All abnormalities should be recorded.

Suspicious cases must be reported immediately to the Diagnosis and Inspection Officer of the READEO. Livestock owners in this zone should be advised about the disease, told how it spreads, requested to report any suspicious signs, and informed to whom they should report. It should be emphasized that the inspection is for the protection of the livestock owner by ensuring early detection of disease and prevention of its spread. Protective clothing or freshly laundered coveralls will be worn and strict cleaning and disinfecting procedures will be followed before entering and leaving the premises to prevent any possible spread of infection. A census of all animals on the farm should be recorded on each visit. Any deviation from previous census should be fully documented and explained.

Inspection of herds within this zone shall continue at twice weekly intervals for 21 days after slaughter of the last infected herd.

#### 6. Quarantine Area Security

Checkpoints should be located on all rural roads where they enter the quarantine zone. At the checkpoints, all vehicles which might contain farm-related products, materials, or animals, shall be stopped. Vehicles without proper permits for movement must be asked to return to point of origin. The checkpoints are not cleaning and disinfection stations. They are for the purpose of controlling movement. Checkpoints are to be manned 24 hours a day for 30 days after the last infected animal is depopulated in the area or until the situation indicates they are no longer needed.

It may not be practical to establish checkpoints on interstate highways. For these highways, the checkpoints should be at exits and entrances within the quarantine zone.

In the high-risk zone, security will be accomplished primarily by patrols. Patrols should stop all vehicles which might contain farm-related products, materials, or animals. Those not accompanied by a proper permit must be asked to return to point of origin.

Patrols should be established and maintained on a 24-hour basis for 30 days, or such period as deemed necessary within the quarantined area. Personnel along with their patrol vehicles should be requested from State police offices, sheriff's offices, or other guard offices. Each road in the high-risk zone should be patrolled at least once every 2 hours or more often if deemed necessary.

The infected and direct contact exposed premises will have guard personnel assigned on a 24-hour basis to ensure that nothing moves off the premises that might carry the infectious agent. See Section I, Part K, Paragraph 4, Infected Premises Security, for additional information.

Farm products from premises not known to contain infected, suspicious, or exposed animals in the quarantine area may be marketed on a permit basis. Criteria for issuing permits will be determined for each outbreak area, but in general, criteria will be less stringent in the quarantine zone than the high-risk zone. Local news media will complement other methods to notify the people of what can and cannot be moved. A permit may be issued for movement if inspection of the product and premises involved demonstrates that such movement will not result in disseminating the disease agent. The permits must clearly identify materials to be moved and the inclusive dates the permits are valid. Permits should be for one day, one movement, and one vehicle. Details on permits for animal movement may be found in Paragraph 8 of this Part.

## 7. Quarantine of Public Livestock Concentration Points

All stockyards, auction markets, sales, assembly points, fairs, and other livestock concentration points in the quarantine area and surrounding areas (as determined by study of livestock movement) should be closed immediately by State action. Those concentration points which may have been exposed before they were closed must be cleaned and disinfected and tested with sentinel animals before being reopened. Concentration points containing animals at time of closure should be handled in the following manner:

a. Concentration points containing known infected animals must be handled as infected premises and all animals depopulated and burned, buried, and rendered.

b. At concentration points containing known directly exposed animals, all animals must be depopulated and burned, buried, or rendered.

c. At concentration points containing no known infected or exposed animals, all animals shall be allowed to proceed to destination under permit with the provision that they cannot be moved again for at least 21 days except direct to slaughter plants. However if doubt regarding exposure status exists, it may be advisable to hold the animal at the concentration points 72 to 96 hours to allow time for development of disease signs. Procedures must be devised to determine that animals allowed to move actually arrive at the permitted destination. For example, telephone calls can be made to all States of destination by the individual issuing permits. The State of destination just then determine that all the animals shipped arrive and are handled properly.

## 8. Movement of Animals to Slaughter

No animal will be allowed to move to slaughter from a quarantined premises or from within a quarantine area unless accompanied by a permit issued after veterinary or other approved inspection.

a. No animals may be permitted to move to slaughter plants if FMD has been diagnosed within a 10-mile radius of the herd within the preceding 21 days.

b. No animals may be permitted to move to slaughter plants from herds that have had direct or indirect exposure.

c. No permit will be issued for movement to slaughter plants unless every animal in the herd has been inspected by a veterinarian within 24 hours preceding movement and found to be apparently free of FMD. Veterinary inspection shall include a record of the number and identity of all animals to be shipped, their individual temperatures, and the results of the physical examination of each animal exhibiting any abnormalities in the herd. Physical examination should include specific examination of the tongue, feet, udders, teats, etc.

d. All vehicles used to transport animals to slaughter plants must be cleaned and disinfected under supervision immediately before they enter the farm of origin and after they are unloaded at destination. Vehicles must be sealed or accompanied by an inspector from farm of origin to destination. Wheels and undercarriage of the vehicle must be cleaned immediately prior to leaving the farm.

e. Slaughter plants receiving animals from quarantined zones must have received prior Emergency Programs and State approval to receive animals permitted out of quarantined zones.

If animals are shipped under seal, the person issuing the permit or sealing the trucks should immediately call the inspector at the slaughter plants by telephone, giving the expected arrival time. The inspector should also be given the name of the person to call if the shipment does not arrive by close of business on the scheduled day of arrival.

#### 9. Recommended Procedures for Control of Movement and Disposition of Milk Products During FMD Disease Outbreak

Purpose: The purpose of these recommendations is to minimize risk of spread of FMD via milk, milk products, or milk byproducts. Milk from cattle infected with FMD has been shown to contain high levels of FMD virus up to 3 days before clinical signs and lesions appear.

##### 1. From Infected, Exposed or Suspicious Herds

a. All milk must be disinfected by the most effective means available.

(1) Heat for sufficient time and temperature to destroy FMD virus.

(2) Addition of acid to reduce the pH to 4 or below or alkali to raise pH to 12 or above.

(3) Addition of other approved disinfectants.

b. Disinfected milk should be disposed of on the premises of origin and in areas free of susceptible livestock whenever possible, such as:

(1) Burial with EPA and State authorization.

(2) Sprayed on open fields or soil injection if possible.

(3) Other suitable locations.

c. Owner will be indemnified for milk ordered destroyed.

2. From High-Risk Zone (Boundaries established on basis of epidemiological evaluations at time of the outbreak)

- a. Milk, milk products, or byproducts are prohibited from use as animal feed and all contacts with animals.
- b. Drivers of milk truck must adhere to sound cleaning and disinfection practices and milk pickup vehicles must be cleaned and disinfected before entering each premises.
- c. Limit milk pickup truck collections to high-risk zone. No pickup on infected, exposed, or suspicious premises.
- d. Inspector should ride with truck driver to ensure adequate disinfection of driver's footwear, hands, vehicle, etc., and to assure milk will not be held at collection points or mixed with milk from outside the high-risk zone unless all milk is to be handled as originating within the high-risk zone.
- e. Identity of milk collected in the high-risk zone will be maintained and controlled from collection through processing and distribution.
- f. All Grade A milk for human consumption must be pasteurized at 170° for 16 seconds and used only for human consumption within the high-risk zone.
- g. All other milk must be processed under high-level surveillance in a manner which will destroy FMD virus, such as milk for:
  - (1) Hard cheese manufacturing.
  - (2) Manufacturing of other products exclusively for human consumption (caramel candy, etc.).

3. From Quarantine Zone

- a. Milk, milk products, and byproducts should be under high-level surveillance to assure prohibition from use as animal feed and any contact with animals.
- b. If milk pickup trucks enter a high-risk zone, all milk in the truck will be considered to have originated in the high-risk zone and be handled accordingly.
- c. Movement from quarantined zone.
  - (1) Permit will be required for movement of milk from a quarantined zone.
  - (2) Application for permits must state the purpose and destination and have the concurrence of State officials at State of destination.

(3) Permits may be issued at discretion of appropriate State or Federal officials for milk originating in the quarantined zone outside the high-risk zone to be preheated within the quarantined zone to 170° for 16 seconds and to move under seal to specified destinations outside the quarantined areas for the purpose indicated on the application.

(4) Surveillance of the processing and distribution of the milk at destination will be at the discretion of State and Federal animal health officials in State of destination.

#### 10. Adjacent Premises Exposure

FMD may be spread by direct or indirect contact. The probability of spread depends on the type and degree of contact exposure. Following are recommendations for some examples of contact exposure:

a. Premises adjacent to infected premises are considered contact exposed premises and animals are considered exposed when there has been direct animal contact (such as over a fence) during the preceding 10 days (or longer if circumstances dictate) before the onset of the disease. Contact premises must be handled the same as infected premises.

b. Animals moved from infected premises to other premises during the 10 days (or longer if circumstances dictate) before the onset of the disease constitute a direct contact exposure. The receiving premises must be handled the same as infected premises. Premises receiving animals from infected premises 11 days to 3 weeks before the onset of the disease should be placed under quarantine and inspected daily for 21 days.

c. The care of susceptible animals on other premises by employees caring for animals in infected herds also constitutes exposure. Such premises should be handled the same as infected premises.

d. Indirect contact exposures to infected herds are defined as those occurring when salesmen, veterinarians, artificial inseminators, employees, family members, or others visit other premises containing susceptible livestock after leaving premises containing infected livestock. Movement of farm products, farm equipment, bulk delivery feed trucks, and bulk milk trucks also constitutes indirect contact exposure. Premises considered as exposed due to indirect contacts must be quarantined and susceptible animals inspected daily for at least 21 days. Other actions may be necessary, depending on the degree of exposure.

Contact exposure or other possible means of spread not of the type or degree described herein should be brought to the attention of the Chief Epidemiologist for evaluation and determination of how they are to be handled.

## 11. Moratorium on Animal Movements

a. Initial quarantine. This is the area which may include one or more States where all movements of susceptible livestock should be prohibited for approximately 72 hours or longer after the first case of FMD is diagnosed. This period is essential to trace movements of possibly exposed animals and to locate all infected herds. Both State and Federal quarantine authority should be utilized. If any State within this area is not able to stop movement of livestock, the Secretary of Agriculture will be asked to declare an Extraordinary Emergency which will provide Federal authority to control livestock movements within a State.

The State veterinarian and the Federal official in each State in the initial quarantined area will:

(1) Cooperate with the READEO Information Officer in preparing and clearing a news release to stop all movement of animals susceptible to FMD. The release will be given immediately to all TV, radio, newspapers, and other mass media in the State.

(2) Telephone the following people and agencies and relate information about the moratorium: veterinary practitioners, artificial insemination agencies, county extension agents, purebred animal associations, public health departments, farm organizations such as LCI, Bureau of Land Management and Forestry Service, and others deemed necessary.

(3) Telephone all livestock markets and stop all sales in the initial quarantined area. Request the markets to determine the origin of all animals in the following categories: out-of-State origin, mixed dealer origin, direct farm origin. Veterinary inspection will be made of all animals at the market, and if positive cases are found, eradication procedures will be initiated.

If no infection is evident, animals for slaughter may be permitted to go to slaughter plants. Feeding and breeding animals may be moved under permit to isolated areas and quarantined with daily inspection for 21 days. (See Part C, par. 8 for further information).

Animals in transit from markets in the initial quarantined area must be traced to destination. If infection is found at the market from which they were shipped, the animals must be appraised and depopulated. The carcasses must be rendered, burned, or buried. C&D procedures must be carried out at all contact points, such as feed, water, and rest stops, or markets. All indirect contact exposed animals should be quarantined for 21 days and inspected frequently, unless other action is deemed necessary. No susceptible animal in this category should be considered negative unless all animals do not develop signs of FMD in 21 days.

(4) Visit or telephone slaughter plants in the initial quarantined area and request the veterinarians or inspector at the plant to--

Find out if any suspicious animals have been slaughtered, and if so, stop all plant activity.

Examine all animals on the premises.

Determine the origin of all suspicious animals slaughtered.

Determine destination of all meat and meat byproducts shipped after the suspicious animals were slaughtered.

Allow the plant to continue to operate under restrictions imposed by the emergency if no suspicious animals were slaughtered and there is no evidence of infection on the premises.

(5) Communicate with officials at all fairs, livestock shows, and other expositions and arrange for veterinary inspection of all animals. If no infection is found, the animals may return to premises of origin under permit and must remain under quarantine at this location at least 21 days with frequent veterinary inspections.

(6) All packing plants and custom slaughtering operations not under veterinary inspection which includes antimortem inspection should be closed or proper veterinary inspection provided.

(7) All garbage feeding establishments must be inspected for adequate cooking procedures and all movement of garbage fed animals except to slaughter stopped. These must be inspected within 48 hours of movement and must move under permit.

b. States outside the initial quarantined area--Since animals frequently move long distances and across several States to distant destinations, the following actions should be taken by the State and Federal official in charge in each State outside the initial quarantined area:

(1) The State veterinarian and Federal official in charge should cooperate with an Information Officer on the national staff in preparing a news release urging all livestock owners to examine their animals and report any suspicious conditions to their local veterinary practitioners or animal health officials.

(2) All livestock moved from the initial quarantined area during the previous 21 days should be located, quarantined, and inspected. All State records (brand records, market-testing records, health certificates, and others) should be reviewed to identify animal movements.

(3) All markets and slaughter plants should be contacted to initiate veterinary inspection and determine origin of animals on the premises.

(4) At slaughter plants, animals that originated in the initial quarantined area within the previous 21 days not known to be directly or indirectly exposed should be slaughtered immediately or quarantined for 21 days under daily inspection, unless other action is deemed necessary.

(5) No animals from the initial quarantined area will be allowed entry into States or areas outside this area.

(6) Slaughter plants and custom slaughtering operations not under State or Federal veterinary inspection should be closed until the emergency has passed.

(7) All garbage feeding establishments must be inspected for adequate cooking procedures and stop all movement of garbage fed animals except to slaughter. These animals and all animals in the herd of origin should be inspected prior to movement and then moved only under permit.

## 12. Quarantine Release

Infected premises may be released from quarantine at the discretion of the READEO Director and the State official only after premises and surrounding areas have been evaluated. (See Section I, Part J--Testing of Premises).







## PART D--SUPPLIES AND EQUIPMENT

During an outbreak, supplies and equipment should be obtained through the supply officer of the READEO. Preplanned kits such as that used by the diagnostic, appraisal, depopulation, and the cleaning and disinfection officer should be kept up-to-date. Supplies used should be replaced as soon as possible.

Items that cost \$200 (APHIS Directive 326.1, 10/10/77) or more and which do not lose their identity through service are accountable. However, all items issued should be documented; and at the end of the emergency, a survey should be made of remaining items for a final report.

### GENERAL FIELD SUPPLY GUIDELINE

#### 1. Protective Clothing and Personal Disinfection Equipment

Fiberglas, metal, or other suitable container for equipment	Rubber hat
Coveralls	Pail
Rubber Coat	Sponge
Rubber Pants	Brush (boot)
Rubber Boots	Appropriate disinfectant (See C&D Section)
Gauntlet rubber gloves (heavy)	Surgical masks
Surgical rubber gloves	Large heavy guage plastic bags

Clothing needs will vary according to ambient temperature and working conditions.

#### 2. Equipment for Veterinarian Making Disease Investigations

Probangs - 1 large and 1 small	1-in. wide masking tape - 1 roll
Nose lead	Metal clip board - 1
Lariat	20-ml. TBTB-6
Flashlight	Swine mouth speculum - 1
Towels	Iowa hog holder - 1
Veterinary thermometers	Fiberglas or metal case 12x23x24 in. - 1
Thermos bottle	Official ear tags and ear tag pliers
5 1/2-in. curved scissors - 1	Coolant Material
Bard Parker handle #3 and pack of 10 blades - 1	Waterproof ink pens - 2
5 1/2 in. tissue forceps - 1	Waterproof tape - 1 roll
20-ml. disposable syringes - 6	Metal pan 12x12x4 in. - 1
15-ml. BD-Vacutainers - 6	Styrofoam specimen container and rigid secondary container (paint can) - 1
20-ml. sterile glass vials - 6	Tranquilizers (for use in examining animals)
1 1/2 in. 20 guage disposable needles - 10	
Safety syringe - 1	
Back Tags and glue	
Surgical or other appropriate masks	

This list is not intended to limit or prevent selection of additional equipment deemed necessary.

### 3. Disposal Equipment and Supplies

#### Heavy Equipment

Draglines	Tractors with scoops, scrapers, and forklifts
Bulldozers	Trucks and trailers
Hydraulic diggers	

Portable corrals; such as metal scaffolds, snow fence or woven wire.

#### Burning supplies

Straw or hay	Kindling wood
Heavy timber	Coal
Old tires	Fuel oil

#### Miscellaneous Equipment

Metal handled knives for slashing and knife scabbards	Tents, metal sheds, trailers for changing clothing
Sharpening stones and steels	Ethylene oxide vials for fumigation
Heavy chains (logging chains) for lifting carcasses onto firebed	Rifles, bullets
Special clothing, insulated underwear and heavy socks if in cold weather	Safety syringe
Quarantine and other forms as may be required	Succinylcholine and other approved agents for euthanasia (see sections relating to this subject)
	Captive bolt pistol
	Hard hat

### 4. Cleaning and Disinfection Equipment

The following list of equipment should be supplied to each cleaning and disinfecting crew on each infected premises immediately upon confirmation of disease. It is the amount required for a team of 10 men. If all items are not readily available, improvise.

Manure forks - 4  
Scoop shovels - 2  
Garden rakes - 2  
Pliers - 1

Rubber coats - 4  
Rubber hats - 10  
Adjustable crescent wrench  
12 in.- size - 1

Pails (12-14qt.) - 6  
Wire brushes with scraper noses - 2 Doz.  
Scrapers (long-handle) - 2  
Flat shovels - 2  
Hoes - 4  
Heavy brooms - 3  
Power spray unit and tank - 1  
2-gal. gas can with gas - 1  
50-ft. lengths of 3/4 in. pressure hose  
with connector on each end - 4  
15-ft. suction hose with connectors - 2  
Spray nozzle - 2  
Rubber gloves - 10 pairs  
Screwdriver - 2  
Phillips' screwdriver - 1  
Claw hammer - 1  
Vinegar (to counteract sodium hydroxide  
NaOH accidentally spilled onto a person-)1pt.  
30 gallon galvanized garbage cans - 2  
10 gallon shop type vacuum cleaner - 1  
100 ft. heavy duty electrical cord and adapter - 1  
50 gallon 8 ml. plastic debris bags - 100  
30 gallon 4 ml. plastic bags for clothes - 50  
Sponges - 24  
Safety goggles - 4  
Plastic tub, 10-gal. - 1  
Long-handle fiber brushes - 4  
Soda ash - 100 lb.  
Sodium hydroxide - 25 lb.  
Liquid detergent - 1 gal.  
Long-handle scrapers (may  
improvise by straightening  
garden hoe)-4  
Axes - 2  
Crowbars - 2  
Hatchets - 2  
Cans (10 gal.) - 2  
Post hole diggers - 2  
Tent or shelter - 1







## PART E--APPRAISAL

All animals, products, and materials destroyed because of infection or because they were exposed to or contaminated by foot-and-mouth virus will be appraised. Appraisals must be based on conditions set forth in CFR, Title 9, Part 53.3.

### 1. Appraisal Teams

Appraisals must represent the interests of the owner, the State, and the Federal Government and be consistent with market values. To ensure protection of the interests of all parties, the appraisals shall normally be made by a team consisting basically of one State representative, one Federal representative, and one consulting appraiser. Provided the State will agree, the State and the Federal Government may be represented by one person, a Federal Veterinary Services employee; however, a team should consist of at least two persons plus the owner or his agent.

An appraisal team should be assigned to each infected premises as soon as possible after diagnosis is made to assure rapid appraisal and depopulation of the animals. No animals may be depopulated until appraisal forms are signed by the owner or his agent. Appraiser should call the owner's attention to the clause on the indemnity form pertaining to liens and mortgages. Upon arrival at the entrance to the infected premises, the appraisal team must change to protective clothing (coveralls, rubber boots, mask and hat) prior to entry. The team should have an Appraisal Packet. The packet (plastic bag) should be made of 6 ml. polyethylene plastic and contain a vial of ethylene oxide to be used to disinfect the contents upon leaving the farm.

Note: One Anprolene (Bard registered trademark for ethylene oxide) vial should be used for each 7 liters of the plastic bag's volume. The contents of the packet (plastic bag) will be removed at the premises entrance and the plastic bag left at the entrance for use upon departure.

The Appraisal Packet should contain--

Appraisal Form with continuation sheets - 2 sets (minimum)

1 metal clip board

10 sheets blank paper

1 ballpoint pen and/or indelible pencil

1 vial of ethylene oxide

2 sets State approval forms (as may be needed)

1 polyethylene plastic bag (6 ml or more in thickness and large enough to hold all of the above and to be sealed by tying in a knot or by wrapping a

cord around it. Tubular drum lining can be cut to any length and serves this purpose very well).

## 2. Special Appraisers

The owner of purebred animals should be advised that special appraisers may be appointed to assist in appraisals of purebred breeding animals, if desired. Special appraisers may be obtained from members of purebred associations, livestock judges, extension agents, and other sources. Registration papers must be presented to appraisers for special consideration for the animals to be appraised as purebreds.

## 3. Appraisal Procedure

a. Determine the correct name and address of each owner or owners. If animals are mortgaged, name and address of mortgage holder.

b. Review with the owner the number of animals by species and their exact location of the farm. All animals living when the diagnostician first arrives will be eligible for appraisal and payment of indemnity. Any discrepancies between the initial earlier census and the number appraised should be reported to the READEO. Draw a rough map of the premises and indicate the location of each group. Check off each group as it is appraised.

c. The appraisal of animals shall be based on the fair market value or replacement value within limits to be established during each outbreak. Animals of the same species and type may be appraised in groups provided that all animals in the group are of comparable value per head or per pound. (Refer to CFR Title 9, Part 53.3).

d. Appraisals of materials shall be reported on Federal and State appraisal forms as needed. Reports of appraisals of materials shall, when practicable, show the number, size or quantity, unit price, and total value of each kind of material appraised. Refer to Section I, Part I, Paragraph 3, e, "Appraisal and destruction of materials," for additional information.

e. Never appraise an animal without the owner or his authorized representative present.

f. Complete appraisal on forms, cross check all figures and obtain owner's signature. Errors are difficult to correct after the animals are destroyed.

g. Advise inspector in charge of premises immediately upon completion of appraisal so that depopulation may be started.

h. Upon completion of appraisal of the animals, the inspector in charge of the premises should be contacted by the appraisal team regarding appraisal of products such as milk, cheese, butter, or materials such as feedstuffs, board fences, wooden feed racks, and old buildings which the inspector in charge has

determined cannot be adequately cleaned and disinfected. Similar items which may later have to be destroyed will be appraised by the appraisal team or inspector in charge and the owner.

i. Upon return to the premises entrance--

Clean and disinfect clothing, boots, and hat. Remove coveralls and leave them on the premises with the inspector in charge.

Place the vial of ethylene oxide, all forms, and other items used on the premises in a plastic bag left at the entrance; add a wet pledget of cotton and seal the bag. Ideal humidity for effective action of ethylene oxide is 70 percent. If the weather is cool (below 70°F.) carry the plastic bag back to the field unit headquarters and allow it to warm to room temperature before breaking the ethylene oxide vial. If the weather is warm (above 70°F.) break the vial before leaving the premises. The time the vial of ethylene oxide is broken should be written down on the outside of the plastic bag, and the plastic bag should not be opened for a minimum of 12 hours.

j. For at least 7 days after their last visit to an infected premises, appraisers must not contact other livestock (visit farms, attend auctions), except other infected or exposed premises to which they are assigned for appraisal purposes.

k. Following a visit to an infected premises, appraisers should not visit places of public gatherings (restaurants, bars, movies) until they have had a complete shower, including a shampoo, and have changed to freshly laundered clothing.







## PART F--DEPOPULATION PROCEDURES

1. Firearms

A depopulation operation carried out under emergency conditions has many inherent dangers and every precaution must be observed to prevent accidents to the personnel involved. Personnel designated to handle firearms should be trained experts and thoroughly familiar with firearms. At the time of actual depopulation all personnel not directly involved should be instructed to leave the area. Whenever they are available, local police, State Patrol officers, county sheriff, or military personnel should handle firearms. Other personnel may use firearms when the READEO Security Officer approves. Permits for firearms should be obtained through local law enforcement officials. Rifles should be used for depopulation except when animals are confined and a pistol can be used at close range. A captive bolt pistol works well for small animals (pigs, sheep, and calves) and eliminates many of the dangers. However, the operator should be thoroughly familiar with the captive bolt pistol. Humane procedures should be adhered to at all times.

Three basic weapons for depopulation purposes are: (1) captive bolt pistol for small animals; (2) .32 or .38 cal. pistol for large animals destroyed in pens, and (3) .222 or larger rifle for depopulating animals in the trench. Jacketed bullets, such as .30 caliber military ammunition, should not be used.

2. Succinylcholine chloride

Succinylcholine chloride has been found to be effective for the depopulation of swine. This drug rapidly produces death when injected intramuscularly, intravenously, or intracardially. Consciousness is usually lost in 30 to 40 seconds after intramuscular administration. According to some authorities, animals perceive abnormal sensations usually less than 30 seconds. However, others are of the opinion that some animals may remain conscious for longer periods, therefore, secondary means of assuredly producing rapid death must be used as soon as the animals are immobilized with succinylcholine chloride. Captive bolt pistols, pithing, and other similar measures are satisfactory. Drug residues in the rendered carcass are of no consequence as it is rapidly hydrolyzed in the blood and tissue in both the living and the dead animal.

Syringes and needles. A 30 ml multiple dose safety syringe with a 17 or 18 gauge, 1 to 2 inch needle is to be used for intramuscular injections. A metal and glass type safety syringe and the intramuscular route of administration are preferred. The syringe must be equipped with a device to regulate the amount of drug to be injected. It also must be equipped with a safety device to block the syringe plunger until the operator has inserted the needle. These measures are taken to prevent massive dosages which might be accidentally injected into personnel with other syringes.

Succinylcholine chloride crystals dissolve readily in distilled water (if tap water is used it should not be "hard"). A sufficient quantity of water should be used to bring the contents of the bottle to its recommended capacity. The

bottle should be shaken until all crystals dissolve. This drug is unstable in solution; therefore, it is recommended that it be prepared and used within 24 hours. It is extremely important that the recommended procedures for preparation of the solution be followed for reasons of effectiveness and safety.

In field trials, a solution of 100 mg. of succinylcholine choloride per ml. of tap water or distilled water injected intracardially, intravenously, or intramuscularly is rapid and humane for swine depopulation.

The recommended dosage to produce euthanasia is 5 ml. of this solution per pig weighing up to 200 pounds and 8 to 10 ml. for heavier swine. Use adequate amount of drug and give rapidly, so death will be rapid and humane.

NOTE: It is quite important that proper concentration (100 mg. per ml.) of succinylcholine chloride be used so that euthanasia is accomplished. Should accidental injection of a human occur, a reliable estimate of dosage received can be readily calculated.

Proper restraint of the animal is essential to safety. Several swine handlers may be needed for depopulation to proceed rapidly and orderly.

Intracardiac injections in small pigs may be accomplished by extending their hind and forelegs. The pigs must be tightly restrained so that sudden movement are avoided. In this manner of restraint, the safety officer must note carefully the position of the pig in relation to personnel's hands, arms, legs, or other parts of the body. If, in the safety officer's opinion, the method of restraint is dangerous to personnel, he shall halt the depopulation until other methods which he deems safer are devised. Individuals using succinylcholine chloride shall be pretested for their cholinesterase activity.

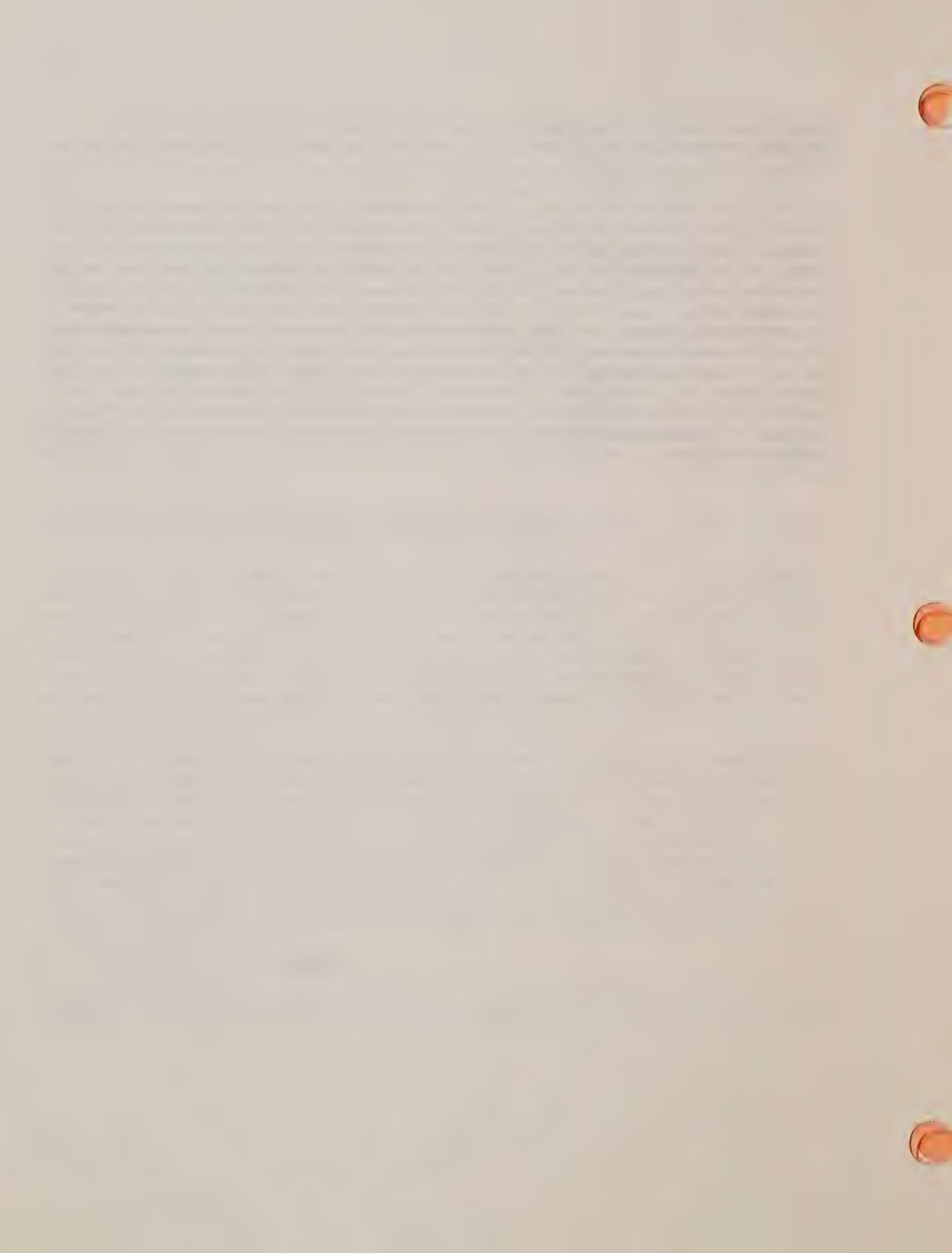
Succinylcholine chloride in the recommended solution is of little consequence should accidental injection be limited to a needle prick of minute dosages. Artificial respiration is the method of first aid if a toxic reaction occurs following an accidental injection. The drug is hydrolyzed very rapidly in the body, but if respiration ceases, artificial respiration is to be given immediately and continued until natural respiration recurs. Emergency respiratory support systems should be available at the depopulation site and the local emergency unit should be notified in advance. If accidental injection occurs, the individual should be placed under a physician's care without delay.

### 3. Supervision of Depopulation

Unnecessary movement of animals should be avoided; however, when they are moved extreme caution should be taken to prevent their escape. A safety officer and

supervisor should be designated for each depopulation by the Humane and Disposal Officer of the READEO. No other duties should be assigned the safety officer.

If carcasses are to be buried, it may be desirable to destroy animals in a trench. When dealing with small herds, the entire herd may be driven into the trench. Large herds should be broken into groups of 25 to 30 animals. After a group is depopulated in the trench, the thoracic and abdominal cavities of all carcasses should be slashed open and carcasses positioned prior to driving in the next group. Lime is not to be used on carcasses because it is believed to retard natural decay processes which in themselves bring about virus inactivation. In some instances, it may be necessary to construct a corral convenient to the trench and depopulate the animals in the corral. The carcasses may be pushed into the trench with a bulldozer. Small pigs and calves and hard-to-handle bulls may be destroyed in their pens and hauled to the trench. Other methods of depopulation may be used provided authorization is obtained from the READEO Director.







## PART G--DISPOSAL

Three methods of carcass disposal include burial, burning, and rendering. Many factors have to be considered and often other State or Federal agencies have to be consulted before the method of disposal is selected.

1. Disposal by Burial

Burying is the preferred method of disposal and should be used whenever practical. Digging the disposal trench should begin as soon as possible after confirmation of the diagnosis. The site should be on the infected premises or as close as topography permits. When selecting a burial site, consider underground cables, water or gas lines, septic tanks, water wells, etc. If possible, choose an area away from public view. Disposal methods must be approved by the environmental quality officer of the READEO.

a. Information should be supplied to the contract officer of the READEO concerning dimensions of the trench, cubic yards of material to be moved, price per yard, charges for blasting or other special techniques, and provision for trench filling and possibly refilling several weeks later after the carcass and fill dirt has been settled. This information is needed for developing a contract for use of heavy equipment.

b. Trench dimensions. A burial trench should be at least 7 feet wide and 9 feet deep. At this depth, 14 square feet of floor space is required for each bovine carcass (5 mature hogs or sheep equal one bovine carcass). It may be desirable to dig deeper (12 to 20 feet) and wider trenches or pits, depending on soil conditions and types of digging equipment available. For every additional 3 feet in depth, the number of animals per 14 square feet of floor space can be doubled.

c. Disposal of feed, milk, manure, and miscellaneous items. Contaminated manure, feed, small volume of milk, and other items may be placed in the trench with the carcasses and covered with at least 6 feet of soil or disposed of by other approved methods. The trench site should be mounded over and the area neatly graded. Do not pack the trench. Decomposition and gas formation will crack a tightly packed trench causing it to bubble and leak fluids.

2. Disposal by Burning

Burning carcasses is difficult and expensive in terms of labor and material. Burning should be used for disposal only when burial is not feasible because of conditions such as high water table or excessive rock, or for public health or environmental protection reasons such as being too close to municipal water supplies.

A holding pen for confining animals prior to depopulation should be available near the burn site. In some instances, farmyards and existing holding pens may be adapted for this purpose. In other cases, new pens may have to be constructed.

a. Selection of burn site. Select the burn site with care. It should be a flat area away from public view readily accessible to heavy vehicles hauling materials. Keep the fire well away from buildings and hay, straw, or feed stacks. Don't build the fire near overhead electric or telephone cables.

Avoid building fire over shallow underground pipes or gas mains. The prevailing wind direction should be considered to prevent unnecessary quantities of smoke and objectionable odors from blowing toward farm buildings or across public roads. The fire will burn better if constructed at a right angle to the prevailing wind.

b. Burning procedures. A burning operation consists of elevating the carcasses on a platform constructed of incendiary materials (oil, wood, coal, straw, old tires, etc.). It will often be difficult to obtain sufficient quantities of suitable incendiary materials. The individual in charge of building the fire must use ingenuity in acquiring materials and putting them to optimum use. Until carcasses are destroyed, the fire should be guarded to avoid dissemination of infected material by predatory animals or birds. The fire will have to be tended and rearranged periodically as it progresses. A small bulldozer or a tractor with a scoop is useful for this purpose. The straw bale platform method of carcass disposal by burning is described.

#### FUEL REQUIREMENTS

Straw or hay: Allow 3 bales per cattle carcass. Contaminated straw or hay can be used in fire preparation. Additional quantities can be purchased from the farmer or local suppliers.

Heavy timber: Allow 3 pieces (approximately 8 feet long by 1 square foot in cross section) per cattle carcass. Railroad ties or bridge timbers make ideal material. If smaller dimension materials such as fence posts or cord wood are used, proportionately more pieces will be needed.

Old tires: Allow 4 or 5 tires per cattle carcass.

Kindling wood: Allow 50 pounds per cattle carcass. This material may be obtained from wrecking companies, farm wood piles, saw mill slab piles, etc.

Coal: This should be of good quality and in large lumps (6 inches to 8 inches diameter preferable; avoid fine coal). Allow 500 pounds of coal per adult cattle carcass. Proportionately less is required for young stock. When goats, sheep, or swine are burned with cattle, they may be placed on top of the cattle carcasses at the rate of two animals for each cattle carcass without additional fuel. Over this rate, or when goats, sheep, or swine are burned alone, allow 100 pounds of coal per animal.

Liquid fuel: Waste oil, furnace oil, or diesel fuel should be obtained in sufficient quantity to thoroughly soak the other materials before the fire is lighted. A minimum of 1 gallon per cattle carcass is required. A reserve supply of fuel oil should be held in case difficulty in burning is encountered. Caution, do not use gasoline.

Estimation of animals: (Bovine Equivalents)

1 adult cow or bull	= 1 C
5 adult swine	= 1 C
5 adult sheep	= 1 C

Reduce all animals to number of C's.

Length of fire: One yard per C (2 pigs, 2 goats, or 2 sheep can be layered on top of each C).

Amount of material per C:

Straw	= 3 bales per C
Heavy timbers (8ft. long x 1 ft. sq.)	= 3 per C
Kindling wood	= 50 lb. per C
Tires	= 4 per C
Coal	= 500 lb. per C
Fuel Oil	= 1 gal. per C

Example:

500 cattle	= 500 C
1,000 swine	= 200 C
700 sheep	= <u>140 C</u>
Total	<u>840 C</u>

Reduce 840 C by 200 C since 2 swine or 2 sheep carcasses may be added for each cattle carcass without additional fuel.  $840 C - 200 C = 640 C$ . Stake out fire line 640 yards long. Line can be divided into 2 or 3 separate lines.

Straw - 3 bales per C	= 1,920 bales
Heavy timber - 3 per C	= 1,920 timbers
(increase if small timbers are used)	
Kindling wood - 50 lb. per C	= 16 tons
Tires - 4 per C	= 2,560 tons
Coal - 500 lb. per C	= 160 tons
Liquid fuel - 1 gal. per C	= 640 gallons

## FIRE PREPARATION

(See fig. 3, "Disposal of Carcasses by Burning")

Select a site and stake out the area of the firebed, allowing 3 feet of length for each adult cattle carcass.

Lay three rows of straw or hay bales lengthwise along the line of the firebed.

Allowing 3 feet run per adult bovine carcass, lay the rows approximately 12 inches apart with 12 inches between each bale in a row.

Push loose straw into the space between the bales.

Place the large timbers lengthwise on top of each row of straw.

Distribute the remaining large and medium-sized timbers across the firebed with 6 to 12 inches of space between timbers.

Next, place the old tires and small kindling wood on the firebed.

Spread loose straw over the wood and tires.

Spread the coal evenly (at the rate of 500 lb. per yard) over the wood and tires to make a level bed. A front-end loader is useful for spreading the coal.

Place carcasses on the firebed. Position them on their backs with feet in the air alternately, head to tail. This can best be done with mechanical lifting equipment (front-end loaders, draglines, trenchers) and chains.

Place loose straw over the carcasses and stuff into all the spaces between carcasses. Pour or spray liquid fuel (Caution: do not use gasoline) over the pyre with buckets or sprinkling cans. If a pump is available, spray the fuel on. Start the fire along the entire length of the pyre. A torch that will burn for several minutes is recommended for starting the fire.

If weather conditions are favorable with a good steady wind, the bulk of the carcasses should be burned within 48 hours. It will be necessary to tend the fire, stirring it occasionally, and replacing carcass pieces that drop off. Additional fuel may need to be added. When all the carcasses have been completely burned and the fire has died out, the ashes should be buried and the area cleaned up, graded or plowed, and prepared for seeding.

### 3. Rendering

The most economical method of disposing of carcasses is rendering. However, satisfactory rendering plants are not always available. The movement of carcasses to the rendering plant poses some additional risk of spreading the pathogenic agents.

Following are some guidelines for consideration:

1. During killing and handling avoid mutilating carcass to keep leakage from carcasses to a minimum.
2. All trucks hauling carcasses to rendering should be leak proof and covered.
3. All infected animals and carcasses should be under 24 hr/day security until the pathogens are destroyed. For example, an official should accompany each truck load of carcasses to the renderer and someone should be on duty at the rendering plant as long as any viable pathogens are present. C&D equipment should be available at the rendering plant and all vehicles and equipment should be thoroughly cleaned and disinfected after exposure to infected carcasses.
4. The rendering plant should be inspected and approved for disposal of the infected and exposed carcasses prior to sending any carcasses to the plant.
5. Care should be taken not to overload the rendering plant and damaging the equipment.

Upon recommendation of the Federal official and the State Animal Health Official, the EP director may provide for other disposal methods.

# DISPOSAL OF CARCASSES BY BURNING

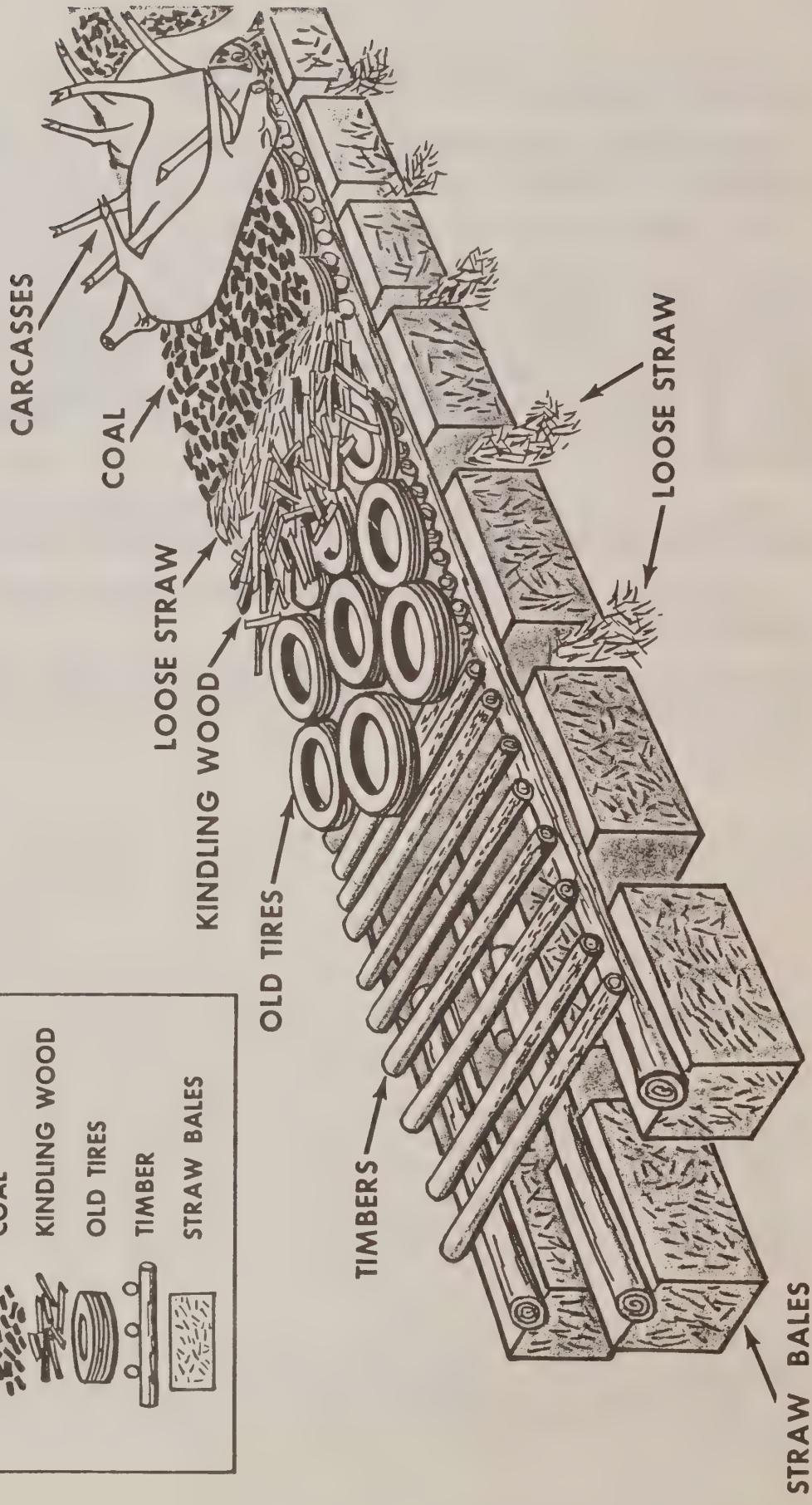


Figure 3





## Part H--Arthropods, Birds, and Rodents

### 1. Arthropods

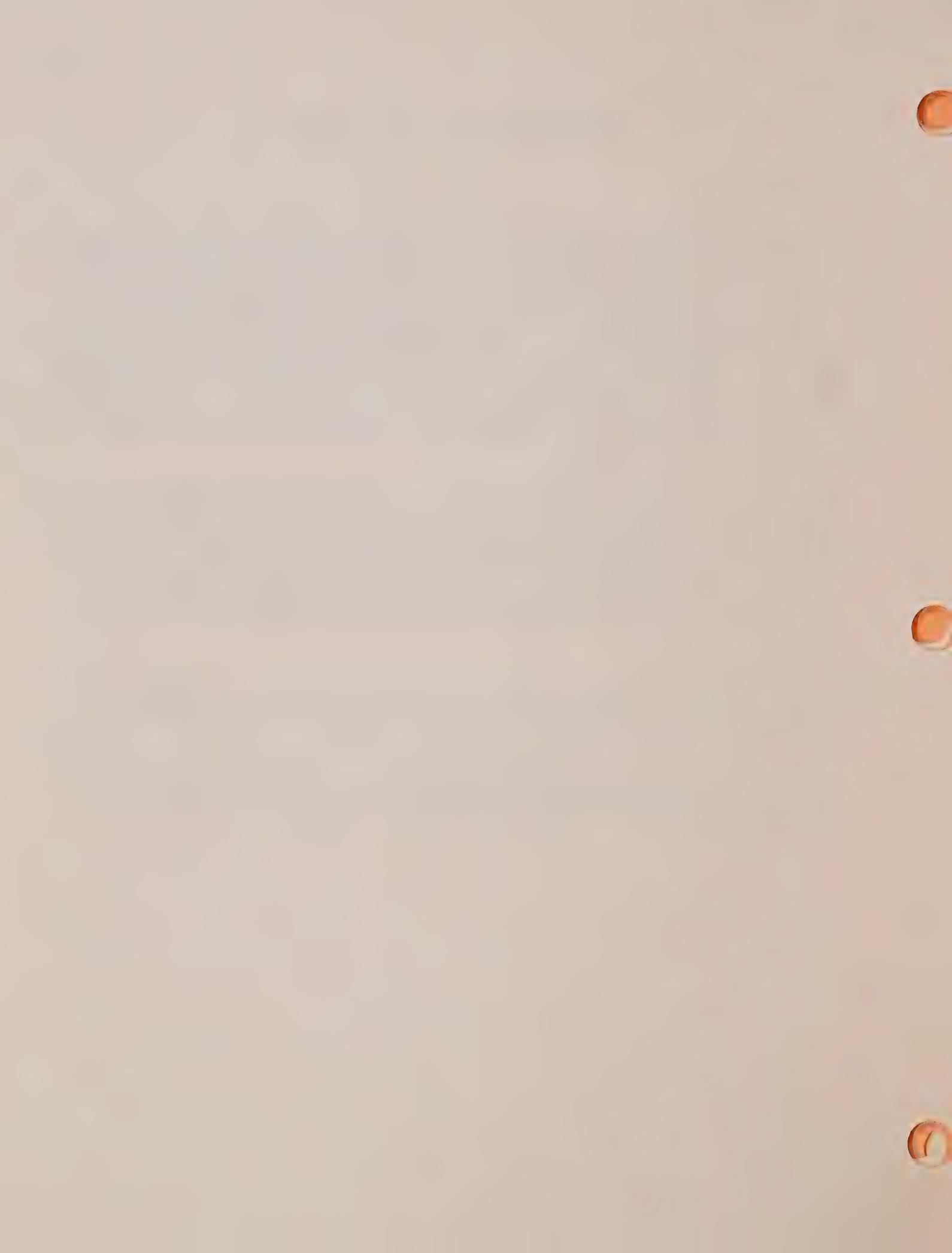
Arthropods (insects, ticks, mites) have long been suspected of playing an ancillary role in the mechanical spread of FMD virus from infected to nearby susceptible premises. Both biting flies (e.g. horseflies, stable flies, horn flies, etc.) and non-biting flies (i.e. house flies and face flies) could contribute to the area spread of FMD under favorable conditions. Therefore, fly control should be considered in those situations in which: (a) large amounts of virus are being shed and available to potential mechanical vectors; (b) a high population density of potential vector species are present and in contact with the virus; and (c) large populations of susceptible hosts are present within effective flight range of the contaminated potential vectors. In addition to flies, lice and ticks may also mechanically transmit FMD virus and should, therefore, receive appropriate attention.

Assistance in the early determination of the potential role of arthropod vectors in disease spread may be obtained from the Principal Staff Officer, Vector Biology, Surveillance, and Control, Technical Support Staff, Emergency Programs. Should vector suppression be indicated, the READEO Vector Control officer is responsible for establishing a control unit with Field Operations. The materials and methods of vector control will depend on the arthropod species involved and various factors associated with each individual outbreak area.

### 2. Birds and Rodents

Birds and rodents, too, have been suspected of mechanically transporting FMD virus from infected to nearby susceptible premises. It is, therefore, necessary to conduct an early survey of the need for bird and rodent control.

Assistance in conducting initial bird and rodent surveys may be obtained from the Wildlife Specialist of Emergency Programs. The READEO Wildlife Officer will be responsible for establishing a control program, if necessary.







## PART I--CLEANING AND DISINFECTION (C&amp;D)

1. Personnel Required

Personnel requirements will vary depending upon the number of buildings, size of area, and sanitary conditions of the area. One or more cleaning and disinfection teams of about 10 men each is recommended for disinfection of large farms and stockyards or salebarns. Each team will be supervised by a person known as the "C&D Team Chief." The team chief will be responsible for securing the necessary equipment and supplies, for scheduling work, and for certifying work accomplished on the infected premises. When more than one team is assigned to a premises, only one team chief should be assigned.

2. Equipment

The C&D chief and members of his team who will be applying disinfectants will be supplied with complete rubber outfits, including boots, coat, pants, hat, and gloves. Other members engaged in cleaning will be provided with coveralls boots, hats, gloves, and masks.

Street clothes will not be permitted on infected premises. At the end of each day's work, all outer garments will be removed and left on the premises. If street clothes are inadvertently worn onto the infected premises, they must be fumigated or disinfected before removal from the premises. During adverse weather conditions, special clothing will be provided and will be either soaked in a permitted disinfectant or fumigated with an approved gas before removal from the premises. After being soaked 12 hours in a permitted disinfectant, coveralls may be removed from the infected premises in a closed container, such as a plastic bag, and washed and reused.

The items necessary for a C&D team to function efficiently are listed in the General Field Supply Guideline, Section I, Part D. Coveralls and boots of proper size should be issued to each man on a team before they leave the field unit headquarters. Additional protective clothing and equipment should be sent to the infected premises as requested by the team chief. The C&D team chief will maintain an inventory of all items issued to him and disposition of each item not accounted for on the inventory.

3. Procedures for Cleaning and Disinfection

C&D teams should be assigned to each premises immediately following confirmation of diagnosis.

a. Entrances. The C&D teams should make sure all entrances to the premises are closed, except one at which security and surveillance can be maintained.

b. Equipment for cleaning personnel and trucks. Equipment for cleaning and disinfection of personnel moving on or off the premises should be available at the entrance to the premises; that is, sponges, brushes, tubs, buckets, and

disinfectant. A tent, metal shed, trailer with shower, or other shelter should be available for changing clothes. Equipment, such as brushes, scrapers, disinfectant, measuring and mixing containers, proportioner, and hose, and high-pressure spray pumps, should be available at the gate for cleaning and disinfecting trucks and other heavy equipment leaving the premises.

c. Spraying equipment. Before initiating cleaning operations, spray all contaminated areas and buildings with an appropriate disinfectant. (See list of disinfectants at the end of this C&D section).

Sprayers operated from the power take-off (PTO) of tractors and self-contained sprayers operated by gasoline engines or electric motors as well as proportioners are available in most areas. With appropriate accessories, most of these sprayers are adaptable to and suitable for disinfection.

Fire department and military equipment may be available in some areas and is very useful for cleaning equipment. The Field Unit C&D Officer should determine the availability of such equipment in the area where disinfection is being accomplished and arrange for its use when necessary.

d. Buildings. All buildings that could possibly have been contaminated should be cleaned and disinfected, including those used by susceptible animals or other livestock and poultry. Special attention must be directed to bulk feed trucks, automatic feeders, and other closed areas to assure adequate disinfection.

The interior of buildings to be disinfected must be thoroughly cleaned. All straw, hay, feed, loose litter, and trash must be removed and burned or buried. All manure and bedding that cannot be burned or buried should be composted according to an approved method for the type of material in order to discourage birds and insects. The compost area should be fenced to prevent livestock, especially swine, and dogs from gaining access. Overhead beams and projections should be swept and washed thoroughly. Encrusted floors, walls, and stalls should be scraped and scrubbed. Parts of buildings, such as stalls, wooden mangers, feed boxes, and wooden floors, which are decayed or in such condition that they cannot be thoroughly cleaned, should be removed and burned. In some instances, it may be necessary to destroy entire old buildings and their contents to ensure elimination of the infectious agent.

The cleaning and washing technique should be so well done that all surfaces and crevices appear free of dirt and debris before the disinfectant is applied. None of the disinfectants can be expected to penetrate manure, blood, or other organic materials more than a few millimeters. Provision must be made for directing wash water into a confined drainage system or a ditch that can be filled and buried later.

e. Appraisal and destruction of materials. Before destroying any material, equipment, or building, USDA and State appraisal forms should be completed and signed by the owner-claimant, the Federal appraiser, and, if appropriate, a State appraiser. (Federal regulations require that the animals or materials destroyed be appraised by a USDA employee if Federal indemnity is to be paid (see 9 CFR 53.3).

When cleaning has been completed, the entire interior and exterior of the structure should be saturated with a permitted disinfectant solution. A power-spray unit or proportioner should be used on all surfaces to make sure the spray gets into cracks, etc. Sufficient solution should be applied to make sure that all surfaces and crevices are thoroughly soaked. Flame burners may be used when necessary, however, extreme caution must be exercised to be sure that no area is left smoldering.

f. Open areas, manure, and waste material. Barnyards, open pens or sheds, and stable areas should be raked and the accumulated waste material burned or buried. Grading or plowing under is preferable. Manure that cannot be buried or burned should be fenced to keep out animals. Manure must remain composted for 3 to 6 months (depending on environmental conditions) before it is spread on open fields. Plastic covers have been used to converse heat and protect mechanical transfer of manure.

g. Hay and crops. Hay, straw, feed, and grain that may have been contaminated should be burned or buried. This includes those parts of the stocks or bins which the owner has been walking over while removing hay or grain, or the parts with which animals may have direct contact. Such parts should have at least 3 feet of loose material, two layers of the bales, or one layer of the sacks removed and burned or buried. Should it be necessary to salvage hay, straw, or grain on farms where large quantities are stored, a careful study should be made to determine the possibility and extent of contamination. All possibly contaminated areas should be condemned and destroyed by burning or burial. The surfaces of remaining stacks of hay, grain, or sacked feed should be thoroughly sprayed with an approved fumigant such as 4 percent formaldehyde solution once a day for 4 days. Formaldehyde gas is sold commercially as a 40 percent solution in water and is referred to as formalin. To obtain a 4 percent formaldehyde solution, 10 parts of the commercial 40 percent formalin should be mixed with 90 parts of water. Feed treated with formaldehyde is safe to feed to animals after a vaporization period of a few days; however, such feed should not be used for a period of at least 30 days.

Silage--A pH below 5 inactivates the virus of FMD. Very good silage has a pH of 3.5; the poorest silage has a pH of 4.8. Contaminated portions of silage pits should be removed and destroyed. The remaining silage should be sealed off for a minimum of 30 days before being used as animal feed.

It may be necessary to plow under fields of crops that are contaminated. The disposition of the crops should be discussed with the Field Unit Veterinary Supervisor.

h. Milk and milking equipment. All milk and milk products destroyed on an infected farm must be appraised on USDA and State appraisal forms when necessary. Obtain local EPA approval for disposal method selected. Before disposal, milk should be acidified by mixing sufficient acetic or other acid to lower the pH below 4 (approximately 3 parts glacial acetic acid to 97 parts milk) or NaOH to raise the pH above 12. Since the addition of acid will cause the milk to curdle, it should be placed in an open receptacle such as an open-end barrel. After acidification, the milk should be buried with the infected animals.

The pipeline milking system should be disassembled and thoroughly cleaned and rinsed and reassembled as for normal cleaning operations and a hot detergent solution at 80 to 70°C. pumped through it for 1/2 hour and a 2 percent acetic acid solution for another 1/2 hour. Following this procedure, the system must be totally disassembled and all porous parts that cannot be disinfected removed and destroyed by burning. Metal parts should be dipped in 2 percent sodium hydroxide. Air lines and other parts not reached by the normal pump-through cleaning should be disassembled and cleaned with 2 percent sodium hydroxide solution. All milk-holding tanks, buckets, cans, wash basins, and other equipment in the dairy should be thoroughly washed with detergent and 2 percent sodium hydroxide solution applied afterward. Miscellaneous items such as brushes, sponges, rags, and other porous items must be burned. Milking parlor and milk room will be cleaned and disinfected the same as any buildings. Two percent acetic acid may be used in lieu of 2 percent sodium hydroxide on machinery and other corrodible areas or fumigation with paraformaldehyde may be employed. (See Section I, Part I, par. 4--Fumigation.)

i. Dogs, poultry, and other animals on the infected premises. All dogs, cats, poultry, and other nonsusceptible animals on infected premises should be confined until disinfection of the premises is completed. Before being released, dogs and cats should be dipped, sprayed, or sponged with a 2 percent acetic acid solution and rinsed.

Eggs and poultry should not be allowed to leave an infected premises except under permit issued by a State or Federal employee engaged in the eradication program. Permits for movement of eggs may be issued provided the egg case or other container is cleaned and disinfected. Permits should not be issued for the movement of poultry until 30 days after completion of cleaning and disinfection.

j. Clothing and equipment belonging to personnel on the infected premises. Shoes, clothing, farm implements, ropes, halters, curry combs, farm trucks, pickups, personal cars, veterinary syringes, needles, or other possibly contaminated items used by the owner or others in handling animals on the infected premises should be destroyed, thoroughly cleaned and disinfected, or fumigated.

#### 4. Fumigation

Fumigation may be the method of choice for disinfecting certain facilities, especially when motor vehicles or machinery are involved or the area is inaccessible for spraying.

a. Paraformaldehyde. Paraformaldehyde can be used as a fumigant. Paraformaldehyde is a crystalline white flakey powder. When heat is applied it produces formaldehyde, a gas. It can be used to fumigate laboratories, machinery, equipment, electronic apparatus, and areas inaccessible for conventional C&D or where the caustic effect of other agents are contraindicated. Formaldehyde gas is noncaustic but when combined with water it forms formic acid which is corrosive. Paraformaldehyde is combustible with a flash point of 93°C and an ignition temperature of about 302°C. The explosive range for formaldehyde resulting from the recommended 0.3g. of paraformaldehyde per cubic foot of space to be fumigated does not approach the explosive range, however, the air in the fumigated area should be kept circulating with electric fans.

Heat has to be applied to liberate formaldehyde from the paraformaldehyde. House-hold type electric frying pans or deep-fat fryers are satisfactory. The temperature should be set at 232°C. (450°F). At this temperature, the formalin in 20 grams of paraformaldehyde will be liberated in 1 minute. Enough frying pans or similar generators should be used to dissipate all paraformaldehyde required in 1 hour or less. Silicone heat transfer fluids that withstand high temperatures for long periods can be used to increase the rate of liberation.\* Without heat transfer fluid about 2 3/4 lb/hour will be transformed into gas; with heat transfer fluid about 8 lb/hour per container. Therefore, the number of frying pans required can be reduced 2/3 if silicone heat transfer fluid is used. Some heat transfer fluids, such as is used in electrical transformers, contain material that may be hazardous to livestock such as polychlorinated biphenyls. No such material should be used on premises where livestock will later be kept. After placing the desired amount of paraformaldehyde in the frying pans, add enough heat transfer fluid so the level is 2/3 the way up the side of the fryer. The fumigation area must be adequately wired for the number of frying pans needed. Pans should be turned off when the formaldehyde is completely generated. This may be done at the fuse box if it is located outside the fumigation area or by electric timers.

Formaldehyde gas, like most other fumigants requires moisture for maximum effectiveness. The humidity should be 55 to 70 percent.

All electricity should be turned off in the area to be fumigated except that required to heat the paraformaldehyde and to operate electric fans. The area should be sealed with plastic or similar material. Make sure the ventilation system is off and all air ducts are sealed. The space should remain sealed at

\*Heat transfer fluid, SF/20, produced by General Electric Co.

least 8 hours after the formaldehyde is released, but it is generally left sealed 24 hours. At no time should this procedure be accomplished by less than a team of two individuals for safety reasons.

Paraformaldehyde is routinely used to fumigate hatcheries. It can be obtained from most poultry supply companies or chemical sales organizations.

b. Ethylene oxide is an effective disinfectant for FMD; however, procedures have not been developed for fumigating large areas. Should it be necessary to employ fumigation or gas disinfection, the Field Unit Veterinary Supervisor should be notified and the possible use of ethylene oxide may be considered.

##### 5. C&D of Slaughtering Plants

When it is determined that a slaughtering plant has processed infected or exposed animals, the following C&D procedure must be followed:

Before disinfection is initiated, remove all meat that has been passed for human consumption not considered to be contaminated.

Meat and hides from infected or exposed animals must be appraised on USDA and State Appraisal Forms and burned or buried. Other hides may be placed in an approved soak or moved under supervision to a tannery for supervised processing. (Refer to AM 593.3, 2-7-66, for approved soak.) The approved soak is a 1 to 10,000 solution of sodium-bifluoride at an initial pH of 3.8. Hides must be soaked 24 hours. The solution shall not exceed pH 5 during this 24 hours.

Horns, hoofs, and offal from unexposed animals may be rendered on the premises or moved under supervision to an approved rendering plant or buried.

Sheds, pens, alleys, and other outside areas must be sprayed with a permitted disinfectant and scraped, brushed, raked, and washed clean. Materials such as sawdust, and pallets that cannot be cleaned, must be burned. A final spray with a permitted disinfectant must then be applied.

All implements, tables, cutting blocks, refrigerators, coolers, floors, walls, etc., inside the packing plant must be scraped, brushed, or washed clean. A final spray of a permitted disinfectant must then be applied. A fresh water rinse must be applied before the plant is allowed to process meat.

Clothing such as coveralls, smocks, and aprons must be soaked in a permitted disinfectant and laundered or burned. Waterproof apparel, boots, belts, knife holders, etc., must be soaked in a permitted disinfectant. Clothing and related articles of little value should be burned.

All personal clothing of employees in locker rooms or other plant areas must be laundered either at the plant or removed in plastic bags and laundered. Arrangements must be made for clean clothing to be brought to the employees.

#### 6. C&D of Stockyards

Stockyards containing or that have contained exposed or infected animals must be cleaned and disinfected using the following procedures:

Spray all areas with a permitted disinfectant.

Burn all items that cannot be properly cleaned and disinfected. (Examples: feed, decayed wooden feed racks, litter).

Scrape and clean all remaining items, including fences, watering facilities, vehicles, scales, ramps, and chutes.

All manure from the floor of each pen and alleyway should be removed to an isolated area for burial or formation of a compost pile. A compost pile should be of an approved nature and a pig-proof fence should be constructed around it. After composting, the material should be evaluated and disposed of in a safe manner. Areas contaminated by movement of people or equipment, such as office areas and seating space around sales' arenas, must be C&D.

Spray with a permitted disinfectant after cleaning.

#### 7. C&D of Carriers

All railroad cars, trucks, and other vehicles that have carried livestock in any quarantined area within a period of 15 days before the outbreak of the disease must be traced and cleaned and disinfected. Exceptions may be made for those vehicles cleaned and disinfected under supervision since last used. The rules for cleaning and disinfecting of vehicles are essentially those governing the disinfection of buildings. Both the exterior including the undercarriage and interior surfaces and all corners and crevices must be cleaned. The interior of the truck cabs should be washed with clean water after which a permitted disinfectant should be sponged on all surfaces. Manure and litter removed from these vehicles should be burned or handled in the manner described for infected premises. This work should be under the immediate supervision of a regulatory employee.

#### 8. Disinfectants

a. Selecting a disinfectant. The selection of a disinfectant is governed by several factors:

Type of surface to be disinfected.

Cleanliness of surface.

Effectiveness (must be on the FMD Approved List.)

Time needed (allow sufficient time for the disinfectant to act on the agent).

b. Precautions. When using disinfectants-

Thoroughly rinse all surfaces with clean water before applying disinfectant where a cleaning agent has been used.

Do not mix one disinfectant with another.

Take proper precautions with all disinfectants and use only at recommended dilution to ensure that no one is injured. Provide protection for eyes and skin of personnel.

c. Responsibility of persons using disinfectants. Persons responsible for disinfection operations must be familiar with the characteristics of the disinfectant they are using and the material they are using it on. pH is the symbol standing for 'potential' (p) of hydrogen (H) ion concentration; it is the logarithm of the reciprocal of the hydrogen concentration and denotes the true acidity or alkalinity of aqueous solutions. In one liter (1,000 ml.) of pure water there is 1/10,000,000 g.-ion or  $10^{-7}$  g. hydrogen; accordingly, pure water has a pH of 7.0 which indicates it is neutral. pH values from close to 7 to 0 indicate increasing acidity, whereas pH values from slightly more than 7 to 14 denote increasing alkalinity.

A disinfectant whose action is based upon its acidity is rendered useless if sprayed upon highly alkaline material, and conversely if the action is based upon the disinfectants alkalinity it is rendered useless when sprayed on highly acid material.

d. Kinds of disinfectants. Sodium Hydroxide (NaOH), 2 percent, is very caustic and will cause irritation to the skin, eyes, and respiratory system but it has many excellent C&D properties. Protective clothing, including goggles and--in enclosed areas--respirators, must be worn when this product is used. The action of NaOH on a virus is dependent on its alkaline pH. It must never be mixed with another product which will alter its alkalinity. (Sodium hydroxide mixed with cresylic acid will alter the pH and will negate the action of both). Sodium hydroxide should not be used on painted portions of vehicles because it will remove paint.

Acetic acid 2 percent is mildly corrosive for metal objects and may leave a slight "stickiness" on rubber objects unless it is washed well with water. It is excellent disinfectant for foot-and-mouth disease virus but has poor penetration, therefore, the surface being disinfected must be relatively impervious

and the virus not buried in organic debris. Vinegar is a weak solution of acetic acid (4 percent). Acetic acid may be purchased at drugstores as glacial acetic acid 99.5 percent. This concentration will irritate the skin, eyes, and respiratory system, but when diluted with water to make a 2 percent concentration, it is safe for most people.

Citric acid 2 percent has similar properties to acetic acid and is usually available at drug stores. It can be used under the same conditions as acetic acid.

Sodium carbonate--anhydrous (soda ash) ( $Na_2CO_3$ )--when mixed with sufficient water to make a 4 percent solution forms a strongly alkaline solution (pH 11.6) that is mildly irritating to the skin. The temperature of the water must be 95°F. (35°C.) to ensure the crystals going into solution. It will remove some types of paint.

Sodium carbonate--decahydrate ( $Na_2CO_3 \cdot 10 H_2O$ ) known as sal soda or washing soda, does not hydrolyze to produce the number of molecules of sodium hydroxide ( $NaOH$ ) that soda ash gives. For this reason, this product is not recommended for use as a disinfectant.

Metasilicate-Protein denaturation and oxidizing activity is less than that of comparable concentration of  $NaOH$ ; however, it is not as corrosive or irritating as is  $NaOH$ . Is often used for its cleaning action in combination with other disinfectants.

#### Quicklime, Slaked Lime, Chlorinated Lime

1. Lime in its pure state is a white highly infusible solid and is used in the commercial production of other chemicals, some of which have been used for disposing of carcasses and disinfecting of premises.

##### a. Calcium Oxide ( $CaO$ )

Synonyms: Quicklime, unslaked lime, burnt lime, calx or caustic lime. Calcium oxide is white or grayish white lumps or granular powder, it sometimes has a yellowish or brownish tint due to iron. On exposure to air, it absorbs  $CO_2$  and water and becomes air-slaked. With a little water, it develops considerable heat and is converted into calcium hydroxide ( $Ca(OH)_2$ ). It is soluble in water, glycerol, and sugar solution, and insoluble in alcohol. It should be kept tightly closed and dry in storage.

Calcium oxide is used in deodorizing vegetable oils, making mortar, plastics, calcium hydroxide, chlorinated lime, and in dehairing hides. It has been used at the rate of one barrel for each eight head of cattle or 16 head of swine or sheep (i.e., one barrel = 850#) to cover infected or exposed carcasses.

It reacts with body acids and water to hasten the decomposition of the carcasses and to discourage and repel rodents and other animals from the carcasses. Lime is not recommended for use in disposal of carcasses or disinfection for FMD virus.

b. Calcium Hydroxide  $\text{Ca(OH)}_2$

Synonyms: Slaked lime, calcium hydrate. This compound is formed when quicklime is treated with water. It is produced as an orthorhombic or trigonal crystals or as soft, odorless, granules or powder with a strong alkaline reaction. It absorbs carbon dioxide from the air to form calcium carbonate. When ignited, it forms calcium oxide and water. It is soluble in acids with the generation of heat, but its solubility in water decreases due to fixed alkali hydroxides. It is soluble in glycerol or in sugar solutions.

Calcium hydroxide is used in making mortars, planters, cements, and dehairing hides. It is used as a waterpaint or whitewash and as an oral antiemetic for infants. It is rarely used to cover carcasses since it has little or no advantage over calcium oxide and is limited by its lowered water solubility. It should be kept well closed in storage.

c. Chlorinated Lime

Synonyms: Bleaching powder, chlorinated soda, chloride of lime or calcium oxychloride. Chlorinated lime is a relatively unstable chlorine carrier in solid form. It is a complex chemical compound of indefinite composition which is usually composed of quicklime ( $\text{CaO}$ ), slaked lime  $\text{Ca(OH)}_2$ , and calcium hypochlorite  $\text{Ca(OC}^1\text{)}_2$ . Maximum available chlorine content approaches 39 percent. Commercial products usually range between 24 percent to 37 percent of available chlorine. It is a white or grayish white powder which, when exposed to air, becomes moist and rapidly decomposes. It dissolves in water or alcohol; therefore, it should be kept dry and tightly closed in storage.

Chlorinated lime: It is used as a bleach, to purify water, decontaminate mustard gas and to disinfect sewage and premises. It is used as a disinfectant for application as a powder or solution to inanimate objects and excreta from infected animals. It is effective in barnyards and areas where animals have been penned. Chlorinated lime is used as an alternate layer in manure piles.

The effectiveness of this disinfectant is due to the release of available chlorine. The germicidal action of this chlorine is due to the chlorination of the amino acids of the proteins of the carcasses. Title CFR Section 71.10 lists chlorinated lime as an official disinfectant when used as: "(3) Chlorinated lime (U.S.P. Strength, 30 percent available chlorine) in the proportion of 1 pound to 3 gallons of water."

Table 1--Disinfectants Foot-and-Mouth Disease

Sodium hydroxide <sup>1</sup> (lye)	2 percent	13 1/2 oz. can to 5 gal. water (mixture)
Sodium carbonate (soda ash)	4 percent	1 lb. to 3 gal. warm water monitored to ensure adequate effectiveness of the working solution.
Acetic acid	2 percent	2 parts glacial acetic acid to 98 parts water (mixture)
Citric acid	2 percent	1 lb. to 6 gal. water (mixture)
Metasilicate	4 percent	1 lb. to 3 gal. water (mixture)

#### 9. Final Inspection

Following cleaning and disinfection and prior to placing test animals on the premises, the Field Unit C&D officer or his designated representative will inspect the premises and determine if C&D is adequate.

<sup>1</sup>

When using lye disinfectant of any strength, wear protective goggles, rubber gloves, and rain gear. Flush areas of the body exposed to lye with lots of water and treat with vinegar.







## PART J--TESTING OF PREMISES

1. Farm Premises

No susceptible animal will be allowed on the infected farm for at least 30 days following completion of cleaning and disinfection. At the end of this period, test animals will be placed on the farm for 30 days to detect residual virus, which may have escaped the cleaning and disinfecting procedures. The number of test animals should be 5 percent of the susceptible animals normally kept on the premises, but not less than five animals. Each group of test animals should include both pigs and cattle. Sheep or goats should be included in the test group if the farm had sheep or goats at the time of infection. Swine weighing approximately 100 lb. each and yearling calves are the most desirable for testing purposes.

Every conceivable precaution should be taken to assure test animals are negative for FMD when brought onto premises to be tested. The test animals should be purchased in an area known to be free from infection and preferably 100 miles or more away from any known infected area.

Test animals must be individually identified. A 20 ml. blood sample must be collected from all test animals and a probang sample collected from each ruminant before the animals are placed on the farm to be tested. Procedures for probang samples are found in Section I, Part B. Each animal must be thoroughly examined and all lesions, scars, or lacerations on the oral mucosa, feet, or body should be recorded in a notebook to record additional information for each animal that may be gained during the test period.

Feed for test animals should be of good quality and not of the type that would irritate the oral mucosa. Feed on the farm should be used if available. Feed purchased for test animals should be obtained from an area known to be free from infection and preferably 100 miles or more from the known infected area. All animals and feed must be hauled in vehicles that have been cleaned and disinfected before being loaded.

A caretaker should be assigned to move the test animals over the premises during daylight hours and to assure that they come in contact with all parts of the premises. The caretaker may be the owner, one of his employees, or other local help. The animal should be kept in a different part, pen, corral, or building each night and fed on the ground in a different place each day. Particular attention should be paid to those areas of the farm where the infected animals were located. Cleaning and disinfection requirements for entering and leaving the premises should remain in force during the testing period.

Veterinary inspection of test animals should be initiated 48 hours after the animals have been placed on the premises and should continue at 48-hour intervals for the first 10 days. After 10 days, the inspection intervals may be extended to semiweekly inspections for the remainder of the testing period.

At the conclusion of the 30-day test period, a 20-ml. blood sample should be collected from each animal, the serum separated and submitted along with a probang sample from each animal to the laboratory.

The test animals may be slaughtered under Federal supervision and the meat used for human consumption provided the laboratory results are negative. Refer to APHIS Directive 220.3 for administrative procedure to dispose of test animals.

Following disposal of the negative test animals, the owner shall be permitted to restock to 20 percent of the livestock population on the farm at the time of infection, provided there has been no infection within a 10-mile radius within 30 days. The restocked animals shall be inspected weekly for 60 days after which time the owner may be allowed to restock completely, provided no infection has been disclosed within a 10-mile radius within the past 30 days.

Conditions may arise that would make it advisable to vary or prolong these procedures. Example: Testing, or restocking, or both, may be delayed if active infection is still occurring in the area.

## 2. Stockyard Premises (See VS Memorandum 577.11)

a. Stockyards with all hard surfaces (concrete or asphalt floor and railings) may commence testing upon completion of cleaning and disinfection at the discretion of the READEO C&D Officer. Sufficient test animals (pigs and calves) should be placed in the yard to assure adequate coverage for detecting any residual virus. The suggested number of test animals to place in a yard is a minimum of five per unit of separable pens and alleys. Pigs should be the primary test animal in a stockyard with three-fourths of the total number of animals being pigs. All gates should be opened before the animals are placed in the yard and when possible the bottom board of the fences should be removed to facilitate the movement of the animals. One or more caretakers should be assigned to move the animals throughout the yard during the day. The animals should be fed on the pen floor in different pens each day and should be bedded down in a different pen each night. The animals should be bled and probang samples of cattle taken as described under Selection of Specimens in Section I, Part B, Par. 5.

b. Stockyards without hard impervious surfaces must wait 30 days after cleaning and disinfection before placing test animals on the premises. Otherwise, testing will be the same as for hard-surfaced yards.

Procedures for testing stockyards may be altered at the discretion of the Director of Emergency Programs. Factors affecting the length of time stockyards may be required to remain closed are:

- (1) Location of the infected animals in the stockyards.

- (2) Number of infected animals.
- (3) Layout of the specific stockyards.
- (4) Physical facility; for example, floors with or without hard surfaces.
- (5) Feasibility of cleaning and disinfecting the entire yard.
- (6) Disease incidence outside the yard.
- (7) Adequate area and facilities for disposal of manure, materials, and animals.
- (8) Type and class of livestock handled.
- (9) Season of year in which outbreak occurs.

### 3. Slaughtering Plant Premises

Slaughtering plant premises do not have to be tested. It is considered adequate for holding pens to be cleaned and disinfected and sealed for 90 days with an additional C&D at the end of that time. This will not prevent the plant from operating under altered conditions during this time, such as unloading directly from trucks into killing pens or construction of new holding pens. For further details see Section I, Part M--Eradication Procedures for Slaughtering Plants.







## PART K--PROCEDURES ON AN INFECTED PREMISES

1. Guideline for Diagnostician Assigned to Investigate Reported Suspicious Cases During Outbreak.

Usually more information can be obtained from the owner in a comfortable surrounding than in animal pens. Therefore, history of illness, source of animals, and other pertinent information should be obtained from the owner prior to going near the animals.

- a. When a suspected case of foot-and-mouth disease is reported to the READEO field unit office, the owner should be advised to restrain the suspected animals and to meet the diagnostician at the farm entrance with transportation if necessary and water for disinfection.
- b. A noncontaminated diagnostician will be dispatched to the farm to investigate.
- c. The diagnostician should park his vehicle outside the farm entrance.
- d. The diagnostician should change from street clothes to protective clothing (coveralls, rubber boots, raincoat, rubber pants, rubber gloves, and rubber hat) at the farm entrance. Street clothes are not to be worn or carried onto the farm. Diagnosticians performing investigations are authorized to dispense with the use of rubber coats and rubber pants in hot weather and substitute lightweight coveralls. However, before leaving the premises, the coveralls must be soaked in a permitted disinfectant. The use of all the rest of the rubber apparel is mandatory when investigations are being conducted and the rubber apparel must be properly disinfected after use.
- e. The diagnostician should either brush or sponge a permitted disinfectant on the outside of all protective clothing and boots before entering the farm. The disinfectant should be left at the farm entrance to be used upon departure.
- f. Only essential diagnostic equipment and items such as pencil, paper, thermometer, and, at night, a flashlight, should be carried onto the farm. If additional equipment is needed, it may be necessary for the diagnostician to return to the farm entrance, disinfect, and then go to the vehicle for it. Professional judgment may dictate other equipment to be carried initially.
- g. The diagnostician should observe the suspect animal (or animals) quietly for a few minutes, then take and record the animal's temperature.
- h. The diagnostician should examine the muzzle, oral cavity, each foot, and the entire udder for lesions. He should record a description of all lesions (location, size, ruptured or unruptured, and age of lesion). Tissue specimens must be collected and submitted for examination in accordance with Section I, Parts A and B.

i. The diagnostician should observe other animals on the farm and examine those that look suspicious to estimate number of infected animals and duration of FMD on these premises. Total number of susceptible animals on farm should be recorded by species.

j. If in the opinion of the diagnostician there is no suspicion of FMD, he should complete items 1 through 7 on the Telephone Report and telephone the results to the READEO Diagnosis and Inspection Unit. (Telephone report form is given at the end of this part.)

k. If in the opinion of the diagnostician there is a possibility of FMD, he should follow the Guideline for a Diagnostician on a Foot-and-Mouth Disease Infected Premises (par. 2 this Part).

l. If the diagnostician is undecided as to a diagnosis, he may ask for consultation with another diagnostician or request laboratory assistance. A return to the premises in 4-6 hours may reveal symptoms and lesions which were not initially apparent.

2. Guideline for a Diagnostician on a Foot-and-Mouth Disease Infected Premises.

The diagnostician on infected premises should:

a. Issue quarantine.

b. Fill out telephone report form items 1-7, inclusive, and telephone the results to the READEO Diagnosis and Inspection Officer. It will be the responsibility of the READEO Diagnosis and Inspection Officer to confirm the case, assign another veterinarian for consultation, or request specimens be shipped to a laboratory for confirmation. Confirmation may be based on clinical evidence, if the disease has been confirmed on a premises within a 10-mile radius, or if there is evidence of contact with a previously confirmed case. However, submission of laboratory specimens for epidemiological data and other information is always desirable and may be requested in certain cases.

The READEO Diagnosis and Inspection Officer will make sure a case number is assigned to each confirmed case. This number should then appear on all documents relating to that case. Numbers assigned to each confirmed case and investigation will be a 6-digit numerical code. The first two digits will identify the State according to the National Uniform Eartagging Plan, these will be followed by two letters representing the disease (FM), and the last four digits will be assigned consecutively as herds become involved. For example, 91-FM-0001, 91-FM-0002, and so on, for the State of Washington.

After receiving confirmation of the case, eradication procedures will be immediately initiated by the Field Unit headquarters.

c. Take the following action while waiting for arrival of the appraisal team, depopulation crew, supplies, etc.:

Review thoroughly the layout of the farm with the owner, lock or otherwise secure all gates, and start making plans of operation. Consider factors such as need to build corral or fences; need to move animals; the amount of feed or hay which may have to be destroyed.

Review plans for depopulation and disposal with owner. Make sure the disposal area is the best possible in terms of moving the animals, moving heavy equipment, possible contamination of domestic water wells, or any danger from fire, smoke, and odors.

Anticipate needs for decontamination equipment to allow personnel, trucks, and heavy equipment to leave the premises when they are finished.

Determine need for rodent and vector control and advise field unit vector control officer.

Institute initial tracing procedures by collecting movement data and telephoning this information to field units or READEO.

d. The diagnostician should initiate the operation as soon as personnel and equipment arrive. The following is the order of preference:

Take all measures necessary to assure no FMD virus leaves the premises.

Establish guard at farm entrance.

Appraise animals and materials.

Start trench, pit digging, fire line or arrange for truck to haul carcasses to rendering plant as soon as equipment and personnel arrive.

The object is to complete arrangements for carcass disposal to coincide with the completion of appraisal.

Start depopulating as soon as appraisal forms are signed by owner. Observe the depopulation operation at all times to ensure the use of humane methods. Check each animal to be sure it is dead.

As soon as the cleaning and disinfection team arrives, plug all drains and soak all the barns, sheds, and milk parlor with a permitted disinfectant before starting to clean.

The appraisal team should appraise all contaminated feed, hay, straw, and buildings to be destroyed, before leaving the farm. Copy of appraisal forms

covering items and buildings to be destroyed will be given to C&D officer before leaving the farm when possible.

Select site for manure disposal (compost, burn, or bury).

If milk is in bulk tanks or cooler unit, appraise with owner and arrange to disinfect before disposal.

e. The diagnostician will be the liaison with the owner until animals are depopulated.

### 3. Checklist for Cleaning and Disinfection of an Infected Premises

a. Spray all contaminated areas with disinfectant.

b. Initiate cleanup of all manure, debris, loose straw, and feed. Bury portions that cannot be burned.

c. Establish a system for hauling manure to previously selected site for disposal. This may involve several tons and may require considerable time.

d. Stalls, barns, and stanchions that cannot be cleaned out with tractors must be cleaned with fork and shovel and scraped clean.

e. If adequate hot water is not available, assign one person to heat water for making sodium carbonate (soda ash) solution (water must be 95°F. before sodium carbonate will go into solution). It may be necessary to build a temporary fire pit of old blocks, bricks, or rocks. Fifty-gallon drums cut in half make excellent containers for heating water. The sodium carbonate may be added to the water as it is being heated.

f. A third crew should be started on cleaning and disinfecting. This crew should start on the first area cleaned out using wire brushes, scrapers, brooms, and ample disinfectant to thoroughly clean each brick, board, pipe, door, and wall. All evidence of manure or other contamination should be removed prior to final disinfection.

g. Extreme care must be used in cleaning the milk parlor. The owner should be encouraged to assist and supervise this operation to prevent damage to equipment. This is an extremely important area since possibly infected animals were milked the day of the diagnosis and virus from lesions (teat, feet, and mouth) as well as virus secreted in milk will have seeded the area thoroughly. Special care should be given to all rubber equipment. It may be best to burn such equipment and replace with new equipment later. Do not forget the inside of milk lines and the milk tank. Refer to Section I, Part I--Cleaning and Disinfection, for instructions on C&D of milk equipment.

h. Continually check each item to assure thorough cleaning. Do not depend upon the disinfectant to do the job. Watch for stray pieces of equipment hanging on the walls or laying in window sills or in the corner of a stall. Items that are worthless should be gathered in one area for disposal. Items the owner considers valuable should be cleaned and disinfected. Ropes, halters, and other items of little value that are difficult to disinfect should be appraised and destroyed.

i. Possibly contaminated hay or straw should have been appraised, removed, and buried or burned during the disposal operation. Remaining feedstuffs should be sprayed with 4 percent formaldehyde as recommended in Section I, Part I--Cleaning and Disinfection (Hay and Crops).

j. Determine the need for insect or rodent control and request services from Field Unit Headquarters.

k. Clean and disinfect owner's trucks, tractors, and cars.

#### 4. Infected Premises Security

Maintain around-the-clock security on an infected premises for the period necessary to accomplish appraisal, depopulation, disposal, and a complete soaking of contaminated areas with an approved disinfectant.

Following is a security checklist:

a. Close and lock or secure all entrances except one strategically located entrance to the premises. Post quarantine and warning signs at all entrances.

b. Post a guard at the one open entrance to the premises and any additional guards around the premises deemed necessary.

c. Allow only authorized personnel wearing proper protective clothing to enter the premises.

d. Allow no one to leave the premises without adequate disinfection under supervision. Emergency movement from the infected premises can be arranged through the officer in charge of the infected premises.

e. Provide proper equipment for cleaning and disinfection of personal and heavy equipment off the premises (foot bath, high-pressure spray rig, brush, sponge, proportioner).

f. Take all precautions to prevent the spread of disease by drainage.

g. Confine nonsusceptible potential spreader animals, such as dogs and cats. It may be necessary to institute extermination measures, such as shooting, poisoning, or trapping to control predatory animals, rats, birds, and other wildlife.

h. Instruct guards to stop movements of milk, meat, eggs, bones, wool, hides, hay, straw, feed sacks, manure, or any other product capable of transmitting the infection from the premises.

i. Arrange for spraying with an approved disinfectant the surfaces of roads or lanes that might have become contaminated outside the infected premises.

j. Guards may be removed from the premises when depopulation and disposal have been completed and the contaminated portions of the premises have been thoroughly soaked with a permitted disinfectant.

k. After the guards have been removed from the infected premises, security will be the responsibility of the cleaning and disinfection team chief.

##### 5. Telephone Report Form

The form to use in reporting a case over the telephone follows:

## DIAGNOSTIC INVESTIGATION - TELEPHONE REPORT

Veterinarian assigned to case \_\_\_\_\_ Field Unit \_\_\_\_\_  
 (Name)

Telephone No. at premises \_\_\_\_\_ Case No. \_\_\_\_\_  
 Date reported \_\_\_\_\_  
 By Whom \_\_\_\_\_

1. Name and address of owner \_\_\_\_\_

2. Address of premises \_\_\_\_\_  
 Map reference or coordinate \_\_\_\_\_

3. Date of investigation \_\_\_\_\_

4. Total livestock on the premises: Cattle \_\_\_\_\_ ; Swine \_\_\_\_\_ ; Goats \_\_\_\_\_  
 Sheep \_\_\_\_\_ ; Horses \_\_\_\_\_ ; Other \_\_\_\_\_

Number of purebred animals included above: Cattle \_\_\_\_\_ ; Swine \_\_\_\_\_  
 Sheep \_\_\_\_\_ ; Goats \_\_\_\_\_

5. Affected animals (number and species) \_\_\_\_\_

6. a. History, signs, and temperature of suspect animals:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

b. Lesions:

Mouth \_\_\_\_\_ Age of lesions \_\_\_\_\_  
 Foot \_\_\_\_\_ Age of lesions \_\_\_\_\_  
 Teats \_\_\_\_\_ Age of lesions \_\_\_\_\_  
 Post Mortem \_\_\_\_\_

7. Tentative diagnosis \_\_\_\_\_

8. Specimens to be submitted to a laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_  
 Flight No. \_\_\_\_\_ Courier \_\_\_\_\_  
 Quarantine date \_\_\_\_\_

10. Depopulation authority received from \_\_\_\_\_ and given for following  
 number of animals:

Cattle \_\_\_\_\_ Goats \_\_\_\_\_  
 Sheep \_\_\_\_\_ Other \_\_\_\_\_  
 Swine \_\_\_\_\_

11. Depopulation crew needed Yes \_\_\_\_\_ No \_\_\_\_\_  
Number of men needed \_\_\_\_\_ Date and Time \_\_\_\_\_  
Method of depopulation: Firearms \_\_\_\_\_ Drugs \_\_\_\_\_ Other \_\_\_\_\_

12. Method of disposal: Bury \_\_\_\_\_ Burn \_\_\_\_\_ Render \_\_\_\_\_ Other \_\_\_\_\_  
Portable corral needed: Yes \_\_\_\_\_ No \_\_\_\_\_ Date and Time \_\_\_\_\_

13. Appraisal team needed: Date and Time \_\_\_\_\_  
Purebred appraiser needed: Date and Time \_\_\_\_\_

14. Address and location of owner's other premises \_\_\_\_\_

15. Are there exposed animals on adjacent premises: Yes \_\_\_\_\_ No \_\_\_\_\_  
Owner of exposed animals \_\_\_\_\_  
Location of exposed animals \_\_\_\_\_

16. List movements of animals, equipment, and materials onto premises during previous 21 days \_\_\_\_\_

13. List movements off premises during previous 21 days (animals, equipment, materials, etc.) \_\_\_\_\_

18. Indicate visits from suspect premises to other premises where animals are kept (owner, family, employees, etc.) \_\_\_\_\_

19. Give address and location of premises where employees, family, or others keep livestock \_\_\_\_\_

20. Give dates of visits and address of visitors to infected premises during previous 21 days. Example: stock owners, feed salesmen and feed trucks, artificial inseminators, veterinarians, stock dealers and buyers, or other persons connected with livestock \_\_\_\_\_

21. Possible source of the disease (owner's opinion and veterinarian's opinion) \_\_\_\_\_

22. Garbage fed: Yes \_\_\_\_\_ No \_\_\_\_\_ Raw \_\_\_\_\_ Cooked \_\_\_\_\_  
Source of garbage \_\_\_\_\_

23. Cleaning and disinfection crew: No. of men needed \_\_\_\_\_  
Date and time needed \_\_\_\_\_

24. Cleaning and disinfection equipment needed at farm entrance \_\_\_\_\_  
Date and Time \_\_\_\_\_

25. Tick and fly control equipment needed: Yes \_\_\_\_\_ No \_\_\_\_\_  
Type of equipment needed \_\_\_\_\_ Date and Time \_\_\_\_\_

26. Rodent control needed: Yes \_\_\_\_\_ No \_\_\_\_\_

27. Most probable source of FMD virus that entered this premises (diagnostician and epidemiologist should concur on this answer, however, if they do not concur, opinions of each should be entered):  
\_\_\_\_\_  
\_\_\_\_\_







## PART L--ERADICATION PROCEDURES IN STOCKYARDS

1. Preplanning Operations for Stockyards

All public stockyards, livestock auction markets and buying stations should preplan the following items:

Locate a disposal area for livestock carcasses. Rendering plant will seldom have the necessary capacity to process all carcasses from a stockyard. The disposal area should be on the stockyard's premises; however, in some cases it may be necessary to locate an area away from the stockyard.

Locate a disposal area for manure and refuse.

Survey availability of equipment for cleaning and disinfection, such as front-end loaders, scrapers, hand sprayers, nonexposed trucks for hauling supplies to the stockyard, separate fleet of trucks for use in the stockyard, and fire trucks for washing and disinfecting.

Conduct orientation and training programs for stockyard personnel.

Brief owner and supervisory personnel on probable actions in an outbreak.

Determine how much disinfectant might be needed to disinfect the stockyard and locate sources of supply of disinfectants, such as sodium carbonate ( $Na_2CO_3$ ) and lye ( $NaOH$ ).

Determine what security measures will be necessary. Select entry and exit points.

Prepare handouts of instructions for stockyard employees in case of an outbreak. Instructions will include personal disinfection procedures. Stockyard employees who own livestock must be advised of restrictions necessary to prevent the dissemination of the disease agent to their animals.

Develop methods of temporarily stopping outbound movements of livestock in lieu of placing a formal quarantine. Some yards may be able to delay or divert shipment of animals to the stockyard.

Each stockyard should develop a guideline covering emergency operations and responsibilities.

2. Guideline for FMD Eradication in a Livestock Market

a. When foot-and-mouth disease is suspected in a market, the following actions should be taken:

Isolate the lot or pen in which the suspected animals are kept and restrict human and livestock movements around it.

Request State or Federal regulatory veterinarian to investigate the suspected disease.

If the regulatory veterinarian suspects FMD an investigation by a Foreign Animal Disease Diagnostician should be requested. Quarantine should be placed on suspected and exposed animals by the regulatory veterinarian.

Collect specimens, notify the appropriate Regional Director or member of Emergency Programs and ship specimens or select a courier to take specimens to the laboratory.

Determine origin of the suspect animal or animals.

Determine the area of the market exposed by the suspect animals.

Locate all vehicles exposed by suspect animals and arrange for cleaning and disinfection of each one.

Limit entry to essential personnel and set up a temporary disinfection station at the entrance and exit of the lot. (Foot bath, bucket of disinfectant, and brush).

At least 2 lb. of sodium hydroxide (NaOH) must be kept on hand to be used initially for setting up temporary disinfection stations. (To make a 2 percent solution, add one 13-1/2 oz. can lye to 5 gal. water).

Maintain accurate records on all movements from the yard.

Restrictions may be necessary for 1 to 4 days to allow completion of laboratory tests.

b. When foot-and-mouth disease is diagnosed in a market, the following action should be taken immediately:

Stop all market activities.

Set up disinfection stations at the entrance and exit of the market to clean and disinfect all vehicles and personnel entering and leaving the market.

Select burial site on stockyard premises if possible. It may be necessary to select an area away from stockyards for disposal of animals.

Remove animals from the yard only in a leakproof vehicle.

Burn all items which cannot be properly cleaned and disinfected. Examples: Feed, wooden feed racks, litter.

Scrape and clean all remaining items, including fences, watering facilities, vehicles, scales, ramps and chutes.

Remove all manure from floor of each pen and alleyway to an isolated area for burning, burial, or formation of a compost pile. (Fence the compost pile and cover pile with 1-inch of soda ash.)

Apply recommended disinfectant after cleaning is completed.

Testing procedures for stockyards are given in Section I, Part J (2). Future market operation would depend upon location of the market. Refer Section I, Part C--Activating READEO's and Quarantining, for guidance.

c. The operation of a noninfected market in a quarantine zone will have the following restrictions:

Only in long protracted eradication programs would a market be allowed to operate in a quarantine area. Operation would be restricted to animals that would be slaughtered within 24 hours.

Accept animals on permit only. Animals originating in the area would move on permit only; those from outside the area would obtain permit from the nearest field unit headquarters.

Inspect all animals upon arrival at the market regardless of origin.

No animals are to remain in the market between sales.

Maintain accurate records on all movements (origin and destination).

Clean and disinfect entire yard at completion of each day's operation.

Establish procedures and facilities to clean and disinfect all trucks or trailers hauling animals.

Maintain continued "cleanup" of alleys and pens.

Establish foot baths for personnel and all persons entering and leaving the market.







## PART M--ERADICATION PROCEDURES FOR SLAUGHTERING PLANTS

1. Preplanning Procedures in Slaughtering Plants:

Preplanning for disease eradication in a slaughtering plant would follow the same general guide as for stockyards. Refer to Section I, Part L--Eradication Procedures in Stockyards, par. 1.

2. Disease Suspected in a Slaughtering Plant:

When foot-and-mouth disease is suspected in a slaughtering plant, the same procedure is followed as for suspicion of the disease in stockyards. Refer to Section I, Part L--Eradication Procedure in Stockyards, par. 2.

a. In addition, if the suspected animal has been inside the slaughter plant, all possibly contaminated areas inside the plant should be cleaned and disinfected before the plant resumes operation.

3. Confirmed Cases Found in a Slaughter Plant:

When infection has been confirmed in a slaughter plant, the following actions should be initiated immediately.

a. Stop all operations and issue quarantine.

b. Begin procedures to allow all personnel to leave the premises after taking a shower and changing to clean clothing. Clean clothing may have to be brought to the plant from the employee's homes. Obtain name, address, and telephone number of all employees who own or care for susceptible livestock.

c. Arrange for veterinary inspection of all animals on the premises. Start disposal procedures for infected and exposed animals. Refer to Section I, Part G--Disposal, for instructions.

d. Identify all lots of carcasses in cooler and freezers by day killed and, source of animals.

e. Determine, if possible, any carcasses which could not have come from infected or exposed animals.

f. Obtain all shipping records from the plant for sufficient number of days back to include any probably contaminated products.

g. Initiate tracing of all products. Purchase products as they are located and return them to the plant or dispose of them by an approved method. Disinfect contaminated areas to the maximum extent feasible.

h. Furnish the READEO Director and the READEO Meat and Poultry Inspection Liaison Officer or the Director, Emergency Programs all pertinent information on animals and carcasses. Procedures to be considered are burial, burning, rendering, and salvage for human consumption.

i. After cleaning and disinfecting has been completed, plant may resume operations within the following limitations:

Operate under veterinary inspection only.

All pens that contained infected animals will remain under seal for 90 days after cleaning and disinfection and may be completely cleaned and disinfected again prior to use.

All other pens after completion of cleaning and disinfection may be utilized to hold animals.

Only sufficient animals for one day's slaughter operation will be permitted on the premises.

All animals must be slaughtered prior to close of each day's operation.

All carcasses must be chilled, not frozen, and remain in the plant for a minimum of 3 days.

#### 4. Operation of a Slaughter Plant In a Quarantine Area

The following operational limitations must be observed for a slaughter plant operating in a quarantine area:

a. Have immediate veterinary inspection of all animals on the premises including antemortem and postmortem.

b. Receive only animals for which a permit for slaughter has been issued.

c. Establish a veterinary antemortem inspection system for all animals immediately upon their arrival at the receiving station of the slaughter plant.

d. Receive only enough animals for one day's operation.

e. Slaughter all animals on premises before the close of each day's operation.

f. Maintain animals from different origins in separate lots and identify carcasses by origin.

g. All carcasses must be chilled and not frozen and remain in the plant for a minimum of 3 days.

h. Determine which employees own livestock or have contact with livestock; quarantine and arrange for a 21-day daily surveillance of all such animals.

i. Stop any susceptible animal contact by all slaughtering plant employees.

j. Establish a cleaning and disinfection system to be used by all personnel and on all equipment before leaving the plant. Placards notifying all persons leaving the plant must be posted.

k. Offal and waste products removed from the plant for rendering must be moved in a closed leakproof vehicle.

l. Sewage from slaughter plants should be properly treated.

m. Products from plants operating in a quarantine area must be marketed within the State unless boned and heat processed until it is thoroughly cooked throughout.

##### 5. On-the-Farm Slaughter

All on-the-farm slaughter of animals within the quarantine areas should be done within the following limitations:

a. Have a veterinarian inspect all animals on the premises before any are killed.

b. Obtain permit for slaughter of animals that is valid for that day only.

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## PART N--GUIDELINES FOR ZOOLOGICAL PARKS

Foot-and-mouth disease not only affects cattle, sheep, swine, and goats, but may affect a great variety of wildlife. Wild and domestic animals in zoological parks may be susceptible to the disease.

#### 1. Precautions for Zoological Parks

Some precautions to be observed by zoological parks are as follows:

Establish an isolation ward and require a 30-day quarantine on all newly acquired animals.

Prevent contact between zoo animals and domestic animals.

Maintain an effective insect and vermin control program.

Orient all zoo personnel regarding foot-and-mouth disease.

Control internal and external parasites.

Restrict contact by zoo personnel with livestock. Zoo personnel should not own livestock for maximum protection of zoo animals.

Carefully select foodstuffs used in zoos, especially feed mixes, protein supplements, and feed additives. Specific attention should be given to the origin of the ingredients.

Establish drainage so waste cannot drain through other pens.

Stress sanitary procedures at all times, and maintain good animal husbandry practices.

Set up cleaning and disinfection foot baths at entrances to pens, and wear rubber footwear when entering pens. Place placards notifying all persons entering and leaving the zoo to clean and disinfect footwear, etc.

Maintain working relationship with APHIS, Veterinary Services representatives.

Establish routine inspections by the zoo veterinarian.

Double fence that portion of the zoological park containing animals under permanent post-entry quarantine.

Maintain accurate records of all animal and bird imports and exports, including movements to other zoological parks.

Animal products and byproducts used as feed for zoo animals should be obtained from outside the quarantined area.

## 2. Eradication at Zoological Parks

a. When the disease is suspected in a zoo, the following actions should be taken:

Isolate the pen suspected and restrict movement into this area.

Report suspected disease to State Animal Health officials or the APHIS, Veterinary Services official in charge and they will initiate an investigation by a Foreign Animal Disease Diagnostician.

Set up disinfection station at pen entrances and exits. Place placards notifying personnel to clean and disinfect shoes, etc. when exiting the zoological park.

Trace all personnel having contact with the suspected pen, and arrange for personal disinfection of each.

Restrict contact with the suspected pen.

Close suspected area of the zoo until test results are obtained.

Use care in refuse disposal (burial, burning, compost).

b. When the disease is diagnosed in a zoo, the following actions must be taken:

Close the zoo immediately and notify EP. Special instructions are required when dealing with rare and endangered species.

Eradication activities may be restricted to the immediate pen or area of the zoo depending upon the isolation and probability of exposure of the other susceptible animals. If all animals on the premises are not destroyed, all animals will be placed on daily surveillance with test animals to ensure the zoo is free of FMD before the quarantine is released.

Eradication activities will be handled the same as described in Section I., Park K--Procedures on an Infected Premises.

## c. Quarantine Area

(1) A zoological park in the quarantine area must institute the following restrictions:

Close the zoo immediately.

Prohibit zoo personnel from having contact with animals outside the zoo.

Prohibit all purchases and movements of feed and other materials from a quarantine area to the zoo.

Accept animals on permit only.

Institute and expand an effective vermin and insect control program.

Establish disinfection procedures for personnel and vehicles entering and leaving individual zoo pens and the zoo compound itself.

(2) "Drive through" open exhibit type zoological parks (where animals roam over large areas) in the quarantine area should institute all restrictions of (1) and in addition all susceptible animals should be confined into pens where inspections may be made more easily.

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## PART 0--TRACING ANIMALS AND ANIMAL PRODUCTS

1. The Need for Tracing

The ability to rapidly and effectively trace the movements of animals, animal products, and related materials in the very beginning of an outbreak of FMD is the key to getting ahead of the disease as well as to determining its source. The same ability during the remainder of an outbreak is essential for final and ultimate eradication. Tracing enables slaughter of exposed herds before they develop the disease, thus preventing production of additional virus and further spread and is one of the most effective early detection in situations where exposure status cannot be determined with available information.

Tracing may involve movements to or from an infected farm or ranch, a stockyard, a meat packing plant, a dealer's premises, or other similar premises. The same basic principles apply to each except the magnitude of the operation and method of obtaining information.

2. Tracing Movements of Animals, Animal Products, and Related Materials to and from an Infected Farm or Ranch

Immediately upon confirmation of diagnosis of FMD on a farm or ranch and concurrently with initiation of eradication procedures, information must be obtained from the owner and employees regarding movements onto or from the premises of animals, milk, meat, manure, farm, or ranch equipment, vehicles, feedstuffs, people, or pets, within the past 21 days or longer if infection has been on the premises for some time. The date of the movement, type of movement, and complete address of the destination of the movement must be provided to the Field Unit Veterinary Supervisor to assure that such exposed premises are located and quarantined immediately.

The Field Unit Veterinary Supervisor should designate one person to coordinate tracing information and movements outside the area of operation. This information should be transmitted immediately to the READEO for action. In a small area outbreak with a low livestock density, it may be possible to carry-out tracing operations with available personnel. However, in a widespread outbreak with overwhelming numbers of movements, it will be necessary to establish a tracing operation involving local police, State police, county agents, and personnel of SCS, ASCS, Forest Service, military, and other available agencies. It may become necessary to utilize Civil Defense volunteers or employ local personnel. In such cases, a recordkeeping system must be established to keep track of each quarantine issued to assure veterinary inspection of the animals under quarantine to ensure that every movement is traced.

A folder should be kept for each person assigned to tracing. A list of all the movements assigned to an individual should be dated and placed in his folder.

When assignments are completed, each premises quarantined should be checked off. Copies of all quarantines issued should be filed alphabetically by county.

An alphabetical card system or computerized records system should also be established with the owner's name and address, census of animals by species, date quarantined, reason for quarantine (animal movement, vehicle movement), and person issuing quarantine. All actions taken regarding the quarantine and disease surveillance must be entered into the written herd record daily. Finally, the date of quarantine release should be entered on the card, which may then be moved to a completed file. All original documents for each herd owner should be maintained in a separate folder. In addition to a filing system, a map system coordinated with master work sheets should also be developed. Movements should be plotted on a map with red pins. The assignment of premises may then be made in an orderly fashion to prevent duplication of visits to farms, but most important, prevent a premises from being overlooked. As copies of quarantines are received, the red pin should be changed to a blue pin. When the animals have been inspected and found free on the first inspection, the blue pin should be changed to a yellow pin. Upon completion of the second negative inspection, the yellow pin should be changed to a pink one and so on down the line. If the color code runs out of colors, change a pin with a different type of head. If infection is found or the herd is to be slaughtered because of exposure, the pin should be changed to black. Green pins should be reserved for herds released from quarantine.

Local personnel will be valuable in locating premises on maps and actual tracing of movements and quarantining of premises until inspections can be made. The primary purpose of tracing is to stop further spread.

### 3. Tracing Movements of Animals, Vehicles, and Personnel From an Infected or Exposed Stockyard or Auction Market

The tracing procedures for a stockyard or auction market are essentially the same as those for an infected farm or ranch. The primary differences are the number of movements, extent of movements, and records of movements from a yard.

The initial problem will be establishment of a system for processing the records rapidly and accurately. Several steps must be considered in establishing such a system:

Determination of the number of days to be covered.

Determination of who has the records (commission firms, dealers, inspectors, State Brand or Veterinarians' Offices).

Estimation of number of personnel required to process the records within a 12-hour period.

Location of working space.

The stockyard personnel are accustomed to their records and can process them much faster than a stranger. In some cases, the commission firm will be able to provide a list of the movements within a very short time. In other cases, it may be necessary to hire the clerical personnel in the yard to process the records.

The following procedures are recommended for processing records from a stockyard or auction market; however, changes in these procedures may be necessary to meet the current situation.

Place the records in a central location in the work space. Maintain control of the records at all times to assure an orderly manner of processing. Records should be returned to the yard management in the same condition as received.

Assign personnel to review each record and make a list of all movements including the complete name and address of the owner at origin and destination, name of the driver of the vehicle if different from the owner, license number of the vehicle, species and number of animals in the shipment.

Local movements should be traced as early as possible. If the area is not under quarantine, the urgency to accomplish tracing is much greater. Local movements may be traced by the Field Unit office in the area or if a field unit is not readily available, a tracing unit to handle local movements should be established.

Movements outside the quarantine area, but within the State, must be reported immediately to the READEO.

Movement outside the State may be reported to the READEO or, at the discretion of the State or Federal Veterinarian in Charge of the State, be transmitted directly to State of destination or to other READEO's in other regions.

For reporting guidelines, refer to reporting chart (fig. 4) at the end of this part.

A list of all personnel employed by the yard should be obtained from the management. Each person on the list should be contacted to determine their movements since the time of exposure or infection in the yard and whether or not they own or contact livestock away from the yard. Each movement must be evaluated and a determination made of its importance. A list of all important movements by personnel of the yard should be compiled and furnished to the field unit or the unit handling local tracing for appropriate action.

A list should be prepared of all vehicles at the yards which may have served to spread the disease. Those vehicles at the yard will be under quarantine and will be cleaned and disinfected before they are released. Other vehicles which may have been contaminated, must be traced; when located, their subsequent movements must be determined and appropriate action initiated.

#### 4. Tracing Movements of Vehicles, Personnel, and Animal Products From Infected or Exposed Slaughtering Plant

Tracing vehicles and personnel movements from a slaughtering plant will be the same as described under paragraph 3. Tracing fresh, frozen, or chilled animal products will prove to be the most arduous task at the slaughter plant. The veterinary inspector and the plant manager should be contacted initially and a determination made of the inclusive dates of movements to be traced. Records should be processed utilizing a system similar to the one described under paragraph 3. The movements must first be listed; then the movements must be grouped according to State, county and city; and finally the information must be transmitted to appropriate officials. Priorities for transmitting information on movements of animal products will be: (1) interstate movements, (2) intrastate movements outside the quarantine area, and (3) intrastate movements in the quarantine area. Each shipment must be evaluated in terms of potential spread of the disease. If all garbage feeding has been stopped, the danger of spread will have been substantially reduced. Shipments of greatest concern would be those into high density livestock populations. Shipments into large metropolitan areas would be of less concern provided garbage feeding has been stopped or garbage to be fed is cooked.

The list of movements to be traced immediately should contain only fresh, frozen, or chilled products from the species involved. (Example: If infected or exposed swine are slaughtered, trace only pork products.)

A list of all other products shipped, including processed products and fresh, frozen, or chilled products shipped, including processed products and fresh, frozen, or chilled products from noninvolved species, hides, and offal should be made and transmitted to the appropriate authorities. Surface contamination of products and vehicles may contribute to the spread of the disease. Since FMD virus survives in lymph nodes and bone marrow longer than in other tissues, special attention should be given to shipment of products containing these tissues.

#### 5. Tracing Veterinary Practitioner Movements

Once FMD is known to exist in an area, every practitioner should be immediately notified of the disease and the dangers of spread should be emphasized to prevent their involvement with infected premises.

A veterinary practitioner may inadvertently go onto an infected premises before FMD is suspected and subsequently visit other premises before the disease has been diagnosed. The subsequent farms, ranches, or stockyards will vary in degree of exposure from the practitioner's visit depending upon the activities he carried out.

When it is learned that a practitioner has visited an infected farm prior to diagnosis, he should be contacted immediately. A detailed written report of his activities, starting with his arrival at the infected farm, must be

prepared. The report should include the identity of the animal or animals he treated, method of treatment, diagnosis, equipment used and disinfection procedures (personal and equipment) used prior to leaving the farm. A list of all subsequent farms visited should be compiled and the above information noted for each. The practitioner's car, work clothes, and professional equipment must be thoroughly cleaned and disinfected immediately, and he should be requested not to contact livestock for a minimum of 7 days. Any drugs the practitioner has which may have become contaminated should be burned or buried.

Each farm visited after the practitioner has been on an infected premises should be inspected for a minimum of 21 days if susceptible animals are on this farm. If visits were made outside the quarantine area, those premises must be quarantined and placed under daily inspection. If exposure is of sufficient magnitude, the animals treated may be depopulated immediately and the herd maintained under daily inspection for 21 days or the entire herd depopulated.

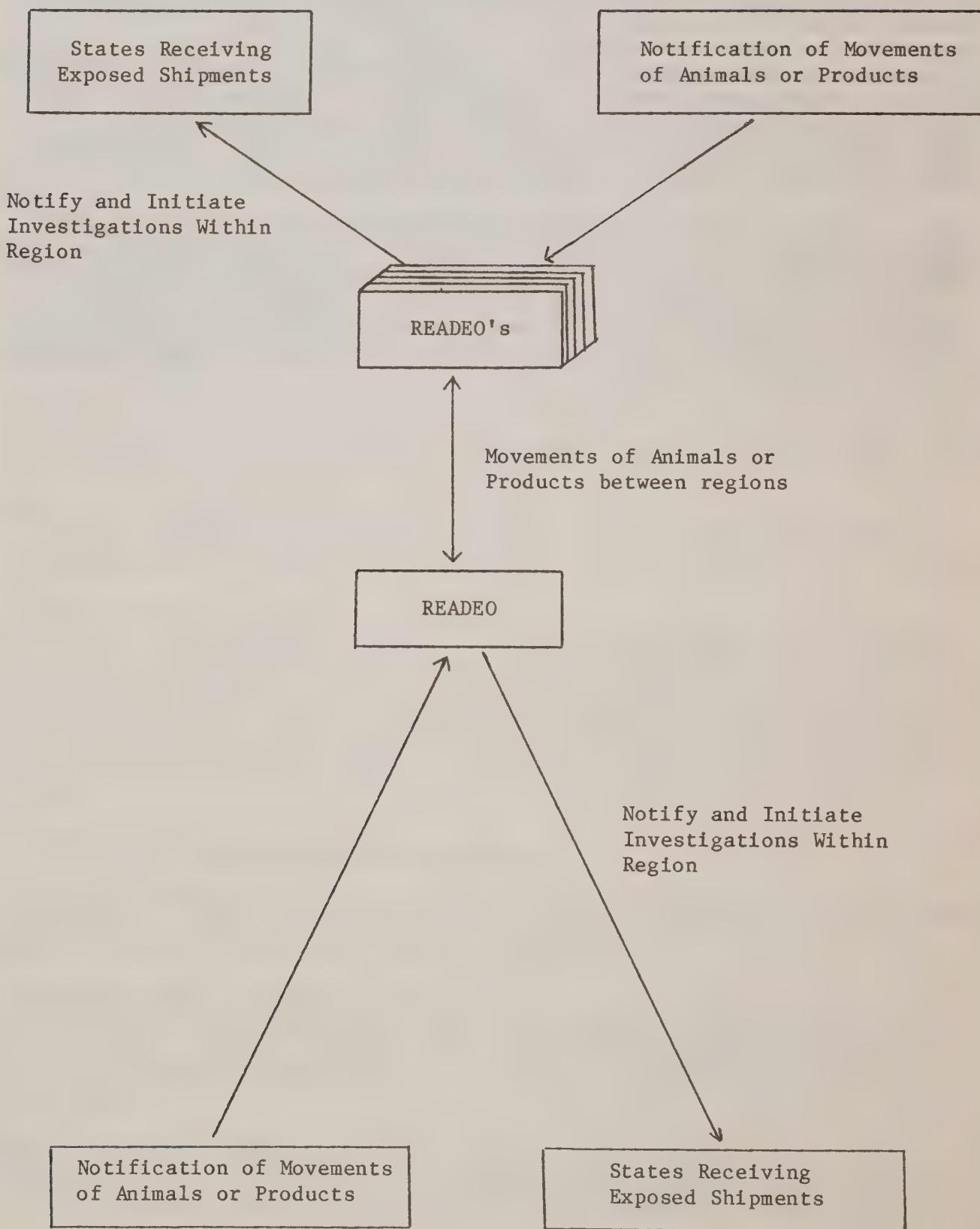


Figure 4





## PART P--DISEASE PREVENTION

1. Introduction

Preventing the spread of infection results in more efficient control and eradication with consequent reduction in cost and time. This Part provides guidelines for containing the infection during an eradication campaign. In addition, regular activities such as farm inspections can also serve as means of spreading the infection. The program depends primarily upon three factors: (a) Awareness of the means by which the infection can be spread, (b) Development of educational programs to ensure that all facets of the industry and the public as well as all members of the campaign are aware of their potential involvement in the spread of infection, and (c) Strict implementation of all measures designated to minimize the spread of infection.

2. Spread of Virus

FMD is a highly contagious viral disease. During the early stages of the infection even prior to development of lesions, essentially all secretions and excretions of affected animals are virus-laden and in addition, highly infectious respiratory aerosols are released. The primary means of spread is movement of infected and exposed animals. Man and items that move with him can also spread the virus. Man is not highly susceptible to the disease but can serve as a vehicle to mechanically transmit the virus in two ways: first, viral contamination of the body surface and clothing, and second by carrying the virus in the upper respiratory tract. Particular attention must be given to changes of clothing, careful disinfection of footwear vehicles, etc. Hair on the head and face of man requires special attention because disinfection of these areas is difficult. Unfortunately, there is no method to prevent the upper respiratory spread of the virus with the possible exception of fullface respirators. Fortunately, virus carried in the upper respiratory tract of man is rapidly cleared reaching low or nondetectable levels in 24 to 36 hours. Any person who has direct or close indirect contact with infected animals are potential spreaders of foot-and-mouth disease virus during an outbreak.

3. Garbage Feeding

Both commercial and home garbage feeding operations have long been recognized as a major means of spreading FMDV. Laws and regulations have been enacted and some controls exercised over these operations. Garbage feeding control is difficult and special emphasis must be given to this mode of transmission during a FMD outbreak.

4. Manure

Manure and associated waste material may spread FMD virus. In certain areas of the country, there will be a need to give special attention to the movement of

manure and the prohibition of such movements during an outbreak of this disease. Composting may be used to reduce FMD virus in manure until the disease has been brought under control.

#### 5. Milk, Milk Products, and Milk Trucks

FMDV is excreted in the milk of infected animals in extremely high titers. The virus is well protected within certain cellular components of milk and additional protection is afforded by the protein and fat content of milk. The flash pasteurization method (161°F for 15 seconds) will not inactivate all of the virus contained in milk from infected animals. Some cheese manufacturing processes will destroy FMD virus, however, cheese must be evaluated on a case-by-case basis. Products such as dried milk and byproducts such as whey should not be fed to livestock. Milk is currently transported great distances in the United States and serves as an excellent means of widespread dissemination of FMDV during an outbreak. Within an outbreak area, milk tanker trucks, truck drivers, and milk cans may serve as vehicles for transmitting FMDV from premises to premises. Procedures for cleaning and disinfection (C&D) trucks prior to entry and prior to leaving the premises will substantially reduce the risk. Drivers should be trained to utilize protective clothing and personal disinfection procedures to further reduce possible spread. Drivers should be specifically instructed to refrain from contacting livestock during the time they are on a premises.

#### 6. Meat Products

There is a high probability during an outbreak, especially during the early phases, that animals in the incubation stage of FMD will be slaughtered. Virus contained in the muscle of such animals will be inactivated by the formation of lactic acid provided the meat is not immediately chilled or frozen. The virus, however, will not be inactivated in lymph node tissue or bone marrow. Procedures for processing meat products from noninfected animals in infected areas have been developed and may be utilized in an outbreak situation. Basically, these procedures include deboning of the meat, removal of the large lymph nodes, and heating to achieve a cooked appearance in the center of the thickest pieces of meat.

## 7. Biologics and Drugs

Biologics must always be considered a possible means of transmitting the virus. Safety testing should be implemented whenever there is any doubt. Contamination of biologics and drugs may also occur during field usage. Procedures should be instituted to prevent the movement of containers of biologics or drugs from one premises to another during an outbreak.

## 8. Wild Birds, Wind, and Insects

Theories have been advanced indicating that wild birds and wind may play a major role in the spread of FMD. Evidence to support these theories thus far have been based on circumstantial evidence. Review of previous outbreaks of FMD in the United States reveals there is no indication that wild birds or wind have played a role in the spread of FMDV. Consideration should be given to studies of these factors during an outbreak.

However, until concrete evidence is obtained these theories should not be considered as major factors in the spread of FMDV. Insects may play a minor role in the spread of FMDV, including those that are transported from premises to premises in vehicles. Procedures should be used to assure there are no insects on or inside vehicles prior to leaving any premises during an outbreak of FMD. This may be accomplished by the use of conventional aerosol application and requires little time or effort.

## 9. Rodents

In the laboratory, rodents such as guinea pigs and mice are susceptible to FMDV. Since rodents will migrate in search of food following the depopulation and C&D of an infected premises, rodent control programs should be a part of the program to eradicate FMD. Poison and traps are available and rodent control should be achieved prior to removal of all feed supplies from a premises.

## 10. Hunting

Many premises are leased or used by the owner and his friends for hunting. The movement of personnel, dogs, and wild game animals being pursued during these activities from one premises to another could serve to spread FMDV. These activities should be prohibited within an outbreak area. Usually, State and Federal agencies that control hunting seasons will prohibit hunting within outbreak areas.

## 11. Livestock Shows

The congregation of susceptible animals during an outbreak could serve as the major means for the dissemination of FMDV. All livestock shows and exhibitions should be prohibited during an outbreak.

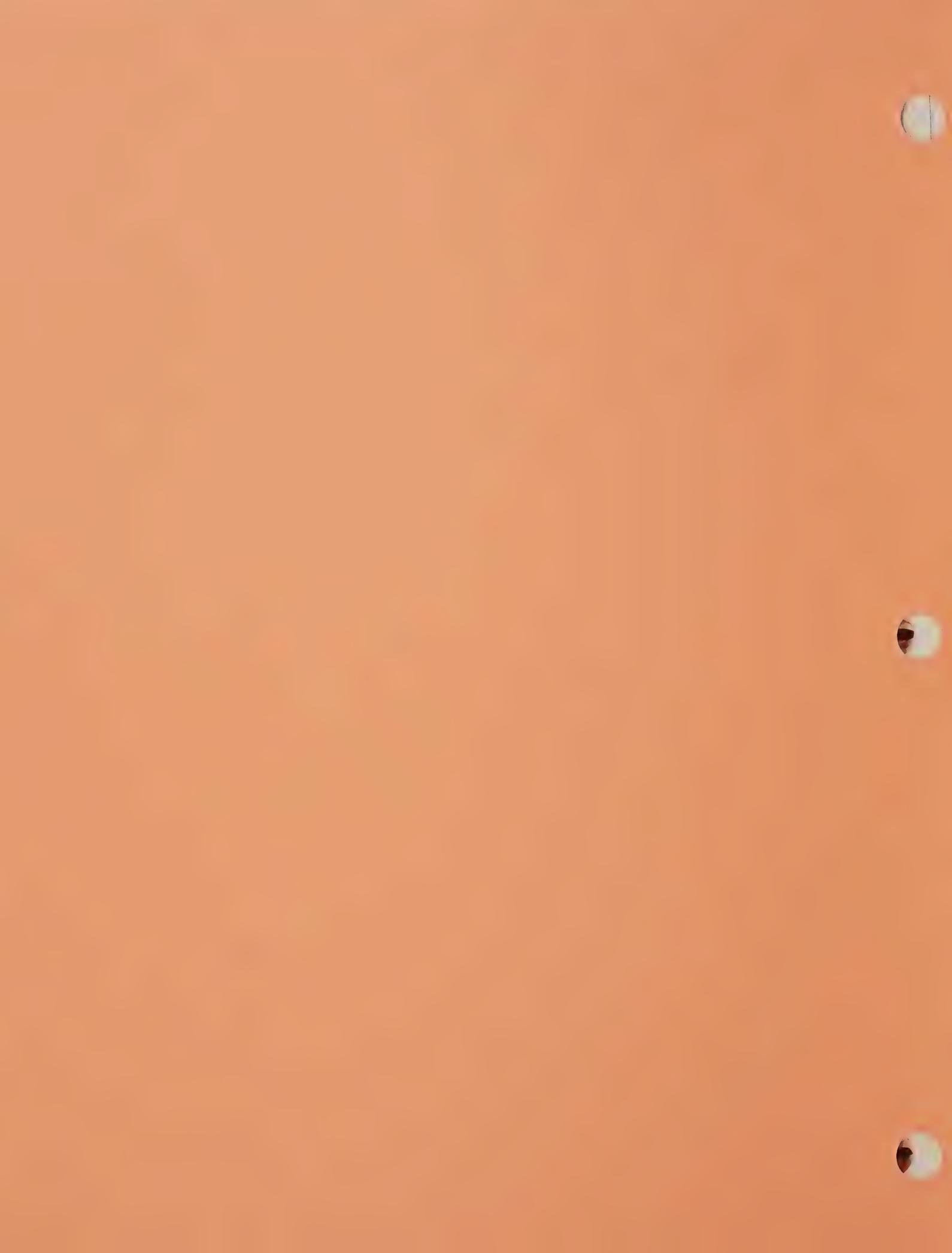
## 12. Rendering Trucks and Drivers

Rendering trucks and drivers may go onto premises and contact livestock during the removal of dead carcasses. They may visit several premises before returning to the rendering plant. Procedures for C&D of the vehicles and drivers between premises should be developed and a program of plant inspection initiated to ensure that rendered products do not become contaminated during the rendering process. Owners of dead livestock should be instructed to move the carcasses to the edge of public roads so they can be picked up without contact with livestock.

## 13. Disease Prevention Program

The success of a disease prevention program will be dependent upon the development of educational material and personal contacts with all segments of the industry that are involved. Brief descriptions of disease spread for each segment of the industries should be developed and published in leaflet form for distribution. Visual aids including movies and slides depicting disease spread should be developed for use during meetings with various segments of the livestock industry. Radio broadcast and TV may also be used to conduct an intensive educational program to ensure that all precautions are taken by the public to prevent additional spread of FMDV.





## PART Q--PERSONAL RESPONSIBILITIES

Personnel assigned to READEO's should be responsible for bringing with them available supplies and equipment needed.

Each person involved in an eradication program for foot-and-mouth disease must recognize his potential for spreading the virus. Everyone, regardless of job assignment, must take all precautions to prevent the spread of the virus or being accused of spreading the virus. All supervisors are equally responsible for personnel under their supervision or guidance. FMD virus may be inhaled and survive for over 24 hours and then exhaled and infect susceptible animals.

### 1. Travel

Personnel engaged in FMD eradication must refrain from travel outside the known infected area except under extreme emergencies and after having taken adequate precautions.

### 2. Vehicles

Vehicles used in eradication procedures must be kept clean at all times and must be disinfected frequently. Vehicles must be cleaned, disinfected, and disinfected before departure from infected premises. Any vehicle that travels to an infected premises and is left well outside its boundaries need not be cleaned and disinfected but should be disinfected as long as it is assigned to that premises and remains within the quarantine area; however, before it is assigned to another case, it must be cleaned and disinfected. Personal vehicles or other vehicles brought into the quarantine areas by eradication personnel must not be removed from those areas until they have been cleaned and disinfected.

### 3. Clothing

Even though a person changes clothing upon departure from an infected premises, he should refrain from visiting public gathering points such as restaurants, bars, and movies until he has showered, shampooed, and changed from work clothes to freshly laundered street clothing. Work clothes, even though freshly laundered, must not be worn for recreation or to public gatherings.

Fingernails should be closely trimmed at all times and should be cleaned after each visit to an infected premises. A separate pair of shoes should be worn during nonworking hours. Hair should be closely cut at all times or adequately protected during work.

### 4. Miscellaneous

The Cleaning and Disinfection Officer should be consulted for disinfection or fumigation of items such as cameras, souvenirs, clothing and other miscellan-



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eous articles before they are removed from the quarantine zones. This applies to items being mailed as well as to those being carried.

Each person is expected to exercise good judgment under all circumstances relating to the possible spread of the disease in addition to the specific procedures outlined in this manual.





## PART R--ARTIFICIAL INSEMINATION RESTRICTIONS

1. Restrictions Inside Quarantine Area

- a. Artificial inseminators shall cease to operate in a quarantine area.
- b. Artificial insemination in the quarantine area may be practiced by individual owners provided semen is obtained from outside the quarantine area and is administered by the owner or his employee residing on the premises.
- c. All artificial insemination rings, centers, studs, associations, etc., located in a quarantine area shall cease to dispense or ship semen. Semen collection may continue for freezing and storage provided each lot is identified and maintained separately and tested for FMD virus using animal inoculation and other tests that may be prescribed by the Director of EP before being moved from the premises. Such establishments shall have daily veterinary inspection of all animals.
- d. Personnel from artificial insemination establishments must practice approved personal cleaning and disinfecting procedures upon entering and leaving the establishment and must not visit other premises where livestock are kept.

2. Restriction Outside Quarantine Area

- a. Artificial inseminators may continue to operate with semen from collection establishments outside the quarantine area provided they do not enter a quarantine area or premises.
- b. All artificial inseminators must practice approved personal cleaning and disinfecting procedures upon entering and leaving each farm.
- c. Semen collection establishments must hold all semen collected for a minimum of 30 days after collection, except in accordance with other procedures as may be approved by the Director of EP.







## PART S--VETERINARY PRACTITIONERS OPERATING IN QUARANTINE AREA

A READEO veterinarian should be assigned responsibility for notifying all private practicing veterinarians in the area of the outbreak and transmitting the following instructions to them.

### 1. Instructions for Veterinary Practitioners

- a. Immediately report any suspicion of FMD to regulatory officials.
- b. When a suspicious condition is encountered, do not leave the premises until relieved by regulatory personnel.
- c. Wear approved personal apparel and use approved cleaning and disinfection procedures before entering and leaving a premises: these include clean coveralls, rubber boots, hat, rubber gloves, approved disinfectant, and vigorous cleaning procedures.
- d. Keep accurate records of all premises visited and treatments used.

### 2. Suggestions for Veterinary Practitioners

To reduce the possibility of transmitting infectious agents, veterinary practitioners should--

- a. Carry a minimum of equipment and drug supplies in their vehicles.
- b. Refrain from using multiple dose vials.
- c. Use disposable equipment whenever possible and leave it on the premises.
- d. Clean and immerse equipment used on the premises in a permitted disinfectant solution before removing it from the premises.
- e. Leave vehicles used in practice outside the premises, or at least outside the livestock area. Wash the vehicles frequently. Disinfect vehicles before leaving premises.
- f. Change clothing, including shoes, when visiting a livestock concentration point.

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should not be

over





## PART T--MAINTENANCE OF RECORDS IN A FOREIGN ANIMAL DISEASE OUTBREAK

The basic premise is that all information should be available at one location for a specific owner. Thus, all documents and reports, including inspection reports, diagnostic investigation reports, shipping permits, VS Form 1-27, garbage cooking reports, laboratory results, quarantines, narrative reports, etc., are all filed in an owner's folder listing the owner's name and case number. The quarantine and any other restrictive documents are all stapled to the left inside portion of the folder. The owner's folder is then filed in an active file by case number by State. The case number is established by using two digits indicating the State, two letters indicating the disease, and four numbers indicating the case number within the State. Once a herd or flock is no longer under surveillance, the folder is withdrawn from the active file and filed in the inactive file drawer in sequence, by case number, by State.

In addition, a card (3x5) file is necessary as a cross-reference. This should be indexed alphabetically by owner. Information included on the cards should include the county, case number, number of animals on the premise, date of quarantine and/or other restrictions imposed, and the dates of inspection and/or investigation. These cards may be flagged with colored tabs at the discretion of the reporting officer to easily locate positive herds or raw garbage-fed swine, etc.

A worksheet should also be developed by county with the names of the owners listed alphabetically down the left-hand side of the sheet. Off to the right of each name, the date of each inspection and/or investigation will be documented in progression upon receipt of the necessary reports. These will be maintained current on a daily basis and copies may be made readily available to the inspector assigned to the area. A quick scan of the master sheets by the field operations officer will quickly indicate whether the necessary surveillance is being done. Should he question the surveillance in a specific herd or flock, he may either check the 3x5 card file or go to the owner's folder.

Once a premises is diagnosed positive, it is removed from the inspection and/or investigation master sheet and put on the positive master sheet. The positive master sheet includes the owner's name to the left with the case number and sufficient blank space to the right to fill in the dates of completion of such actions at appraisal, depopulation, disposal, cleaning and disinfection, introduction of sentinel animals, lab results, and release of quarantine.

Supplemental master sheets may also be developed to complement the inspection/investigation master sheets in such areas as raw garbage feeders and surveillance of high risk herds as used during the hog cholera surveillance program in New England.

It is helpful to have all positive premises plotted on a map in the field office. However, it should be the responsibility of the inspector assigned a county or portion of a county to know the location of all premises within his assigned area and to have in his possession, with a copy on file in the field office, a map with each premises properly located should someone else have to take over his assigned areas of responsibility.

The basic flow of documents is as follows: the inspector or investigator delivers the completed reports to the reporting officer, the reporting officer ensures the necessary information is transposed on the 3x5 card files and various master sheets before delivering the completed reports to the diagnosis and inspection officer. The diagnosis and inspection officer quickly reviews the forms and has copies made of those he would like to study further. The reports are then returned to the reporting officer and filed in the owner's folder. It should be emphasized that these folders should never be allowed to leave the files without someone signing as being responsible for them. Thus, at any given point in time, the records for a given owner are available to all people concerned and may even be readily adapted to a computer system should that be desired.





## PART U--DAILY REPORT

A daily report must be submitted from each READEO during a foot-and-mouth disease eradication program. The report should cover a 24-hour period from 6 p.m. to 6 p.m. and must be submitted no later than midnight of the same day. All suspicious infected and exposed herds must be identified by a 6-digit numerical code by the READEO office. The first two digits will identify the State according to the National Uniform Ear Tagging plan, these will be followed by two letters representing the disease (FM), and the last four digits will be assigned consecutively as herds become involved; for example, the first herd involved in Kentucky would be coded 61FM0001 and the fifth herd would be coded 61FM0005, etc.

The following information should be included in the daily report:

1. Infected Herds

a. List new herds found infected and/or exposed herds authorized for depopulation during this reporting period with the following information for each:

Owner's name, address, and county, location of herd and herd code number.

Number and kinds of animals--cattle, sheep, goats, swine, others--in herd (indicate purebred or grade).

Date and time of quarantine.

Estimated total State-Federal indemnity for each herd, separated into animal and material destroyed.

b. Give the accumulated total number of infected and contact herds authorized for depopulation including those in this report.

c. List by code number infected herds and contact herds depopulated during this reporting period. Include the method of disposal and number of animals in each herd:

Buried  
Burned  
Rendered

d. Give the accumulated total number of infected herds and contact herds depopulated including those in this report.

e. List by code number infected herds and contact herds pending depopulation and total animals to be depopulated.

f. Give the accumulated total of animals depopulated (including those in this report) by the following categories:

Cattle  
Sheep  
Goats  
Swine  
Other

2. Indemnity

a. Give indemnity, by animal and herd code numbers actually obligated this reporting period including infected and contact herds for:

State  
Federal

b. Give cumulative total indemnity obligated to date including infected and contact herds for:

State  
Federal

c. Give cumulative total indemnity obligated to date for materials destroyed:

State  
Federal

3. Interstate Movements

a. List States receiving shipments of potentially exposed livestock during preceding 21 days including number of shipments and animals to each State. List of livestock markets or concentration points receiving shipments.

b. Indicate whether receiving States have been notified by telephone and telegram.

4. Quarantine

a. List counties or parts thereof placed in quarantined areas this reporting period.

b. List counties or parts thereof removed from quarantined areas this reporting period.

c. For the quarantined areas this reporting period, list the number of:

Auction markets  
Stockyards

Feed, water, and rest stations  
Other livestock concentration points

5. Inspections

a. Give the total number of herds and animals in:

Quarantine areas

b. Give the total number of herds and animals inspected during this reporting period in:

Quarantine areas

6. Cleaning and Disinfection (C&D)

a. List premises C&D completed on this reporting period.

b. List premises C&D pending on this reporting period.

c. List other premises C&D this reporting period:

Feed, water, and rest stations

Stockyards

Auction markets

Other

d. List C&D spray units by:

Number of units assigned to READEO

Number of additional units needed.

Number of units available for transfer.

7. Personnel

a. Give total number of personnel presently assigned to READEO, regardless of agency.

b. Give total number of Veterinary Services personnel by grade and class assigned to the FMD eradication program.

c. Give names of Veterinary Services personnel detailed, transferred, or reassigned during this reporting period.

To the READEO

From the READEO

d. Give total number of temporary personnel this reporting period:

Veterinarians

Livestock inspectors

Other

e. Give names of Foreign Animal Disease Diagnostician currently working the READEO.









## SECTION II--EPIDEMIOLOGY

## Part A - Purpose of Epidemiology

The purpose of the epidemiological investigation is to determine how the disease appeared, how it spread, and how to control and eradicate it.





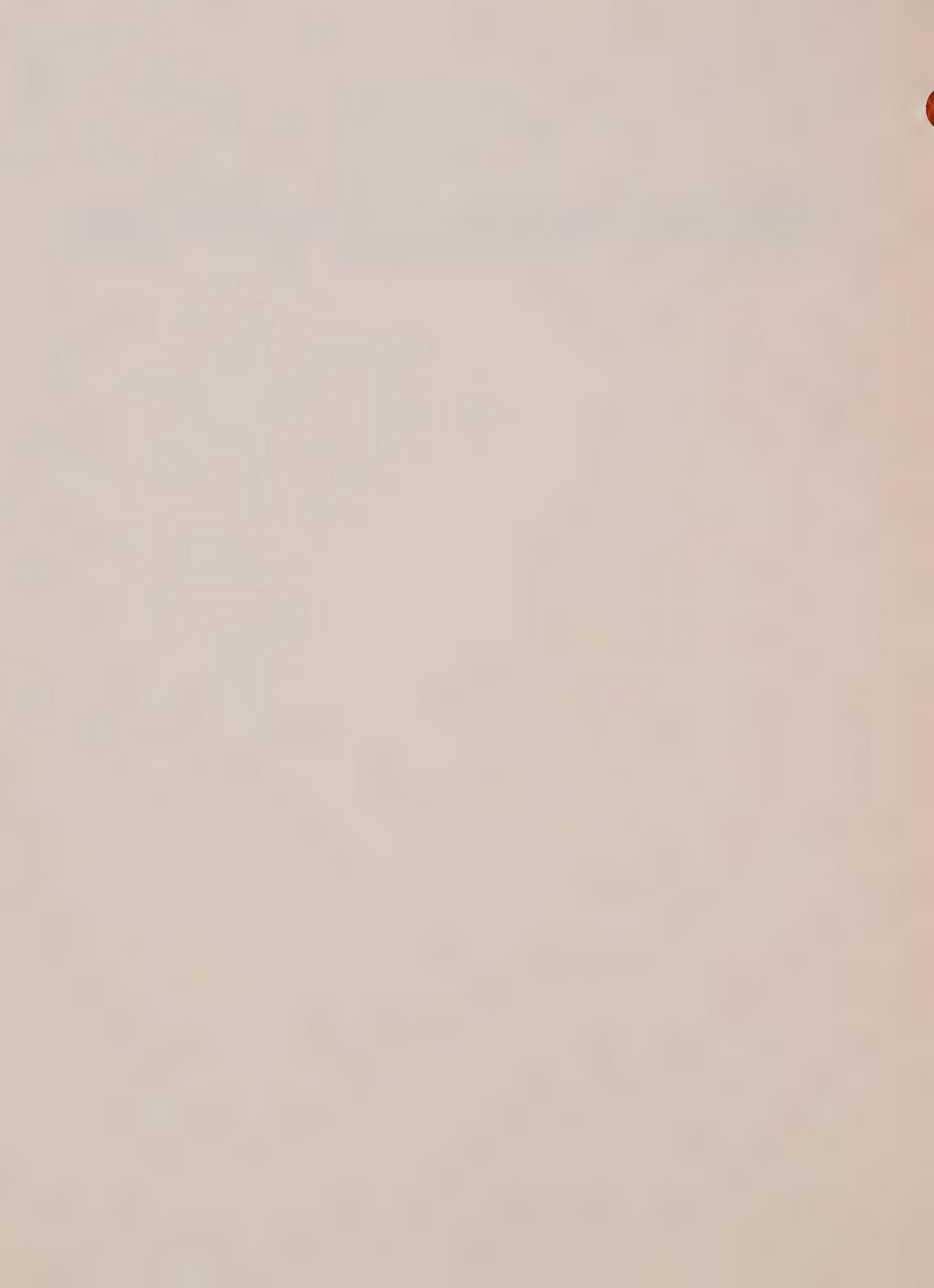


### Part B - Function of the Epidemiologist

Usually disease begins and is maintained by an interaction of multiple causes. These may be related to the animal host, specific agent, or the environment. They may be associated with climate or geography; micro-organisms, toxins, or nutrition; arthropods or wildlife; housing, husbandry, or management. The epidemiologist observes, describes, and analyzes these aspects of the disease problems. He does not purposely seek new knowledge about the nature of the disease, though it may follow from routine investigations. Rather, the epidemiologist is concerned with the practical application of what is already known about etiology (cause of disease) to explain and to cope with the disease.











## Part D - Duties of Epidemiologist

### 1. READEO Epidemiologist

The READEO Epidemiologist will be responsible to the READEO Staff Support Officer. He will review both written and oral epidemiological reports received from field units. Based upon his evaluation of these reports, he will make recommendations as to the source, spread, and method of control of FMD.

### 2. Field Unit Epidemiologist

Field Epidemiologist will be assigned, as needed, to each field unit to conduct investigations of each infected premises and the area involved. Investigations which lead to adjacent field units or to other areas of the State or Nation shall be reported through the Field Unit Veterinary Supervisor to the READEO Field Operations Officer and READEO Epidemiologist to obtain assistance in completing the investigation. An epidemiological investigation shall be completed on each premises as rapidly as possible, and the Epidemiological Investigation Report shall be completed and distributed immediately to the READEO and National Emergency Field Operations, Emergency Programs, for evaluation.

The READEO Epidemiologist will select field epidemiologists as needed from a national roster of regulatory veterinarians with training in epidemiology. When epidemiologists are not on field unit assignments, they will report to the READEO Epidemiologists.

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al o scopo de atraer a la gente que viene de turismo  
a Miami para visitar el parque. El turismo es uno de  
los principales en la ciudad, ya que es un destino para los  
que vienen de vacaciones de verano, o para los que vienen  
de vacaciones de invierno, ya que el clima es muy bueno.

El parque es muy grande, con una extensión de 1000 hectáreas y  
se divide en tres secciones principales: la sección de la selva tropical, la sección de la selva seca y la sección de la selva húmeda.





## Part E - Techniques of Investigation

The following are the principal methods of data collection and submission:

### 1. Observation

Whether it comes from the laboratory or from the field, reliable data and observations are fundamental to all scientific inquiry. The objective is to obtain facts that may serve as the basis for program evaluation and changes.

### 2. Questionnaire-Interview

The epidemiologist has his first interview and obtains preliminary data usually from the veterinarian who precedes him to the operation and with whom thereafter he works closely. Subsequently, the more channels of communication the epidemiologist establishes, the greater the possibility of obtaining useful information. Discrepancies in the accounts of informants are investigated further.

The written questions are both closed and standardized (that is, they require factual information), as well as open-end (that is, they permit extended explanation). The interview is similarly loosely structured to permit the epidemiologist to acquire as much information and opinion as he believes justified. An indexing system in a diary consistent with coding in the questionnaire, names of persons, and dates may be helpful for reports and reference.

Supplementary to diaries and reports, a diagram of infected premises, spot maps showing geographic distribution of the disease, and graphs portraying disease incidence by weeks help establish time and space relationships of the disease.

### 3. Submission of Data

Significant information is reported daily by telephone through appropriate channels. Field reports, questionnaires, premises diagrams, and spot maps are submitted as soon as they are completed. Data are assembled, categorized, and recorded in Emergency Programs National Headquarters for analysis and program evaluation.







## Part F - Epidemiological Investigation Report

To avoid several people asking owners the same questions, the epidemiologist should complete as much of this report as possible from information available before visiting premises and owners.

Case number:

1A. Name, Telephone Number, and Mailing Address of Owner of Animals

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1B. Name, Telephone Number, and Mailing Address of Owner of Premises (if different from 1A)

---

2. Location of Infected Premises      A. State      B. County      C. Township

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            D. Section      E. Direction and Distance (miles) From Nearest City  
            or Town

---

3. Disease Reported by (Name of farmer, veterinarian, etc.) and Date

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4. Date Clinical Signs or Lesions Observed by Owner

---

5. Date Reported

---

6. Date and Time of Epidemiological Investigation

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Kind	Total No. on Premises	Affected	Animals						Lesions									
			Number			Mouth			Foot			Udder			Age of Lesions			
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7. Cattle																		
8. Horses																		
9. Swine																		
10. Sheep																		
11. Goat																		
12. Other (Specify)																		
13. Additional signs and Lesions Seen (Circle)																		
	1. Excessive salivation						4. Inappetence						7. Abortion					
	2. Reduced milk flow						5. Listlessness						8. Other (describe)					
	3. Lameness						6. Mastitis						9. No information					
14. Disease or Diseases Suspected																		
15. Source of Affected Animals in Items 7-13.																		

(Circle one)

16. Have any other animals on the premises been sick within the last 6 months?

1. Yes                    2. No

If Yes, give:

- A. Number and kind of animals.
- B. Describe signs and lesions.
- C. What was the suspected disease in each case?
- D. By whom and how were they treated?
- E. Did animals recover or die?
- F. If recovered are they still on the premises?
- G. If sold, to whom?
- H. If dead, how were carcasses handled? (Describe)

17. Have any neighbors had sick animals recently?

1. Yes                    2. No                    3. No info.

If Yes,

- A. Identify by name and location.
- B. Give suspected illness.

18. Have any animals moved onto the premises for any reason within the past 6 months?

1. Yes                    2. No

If Yes, give:

- A. Reasons for movement.
- B. Dates
- C. Number and kind of animals.
- D. Names and owners or handlers and places of origin.
- E. Method of transportation.

19. Have any animals moved off the premises for any reason within the past 6 months?

1. Yes                    2. No

If Yes, give details as in 18 A, B, C, and E, and names of consignees and locations.

<p>20. Does owner of animals (or of premises) have animals on other premises?</p> <p>If <u>Yes</u>, indicate:</p> <p>A. Location      B. Kinds and number      C. Whether separate staff is provided.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>21. Do farm employees live on other farms?</p> <p>If <u>Yes</u>, give:</p> <p>A. Name and location of farm.      B. Number and kind of animals maintained.      C. History of animal acquisition, movement, etc.      (This may necessitate a separate epidemiological investigation.)</p>	<p>1. Yes</p>	<p>2. No</p>
<p>22. Give numbers of dogs, cats, poultry, pigeons, exotic waterfowl, wild waterfowl, etc., on premises.</p> <p>A. Are pets and poultry confined or penned?      B. Are pets fed meat and bones? If so, list sources of supply and locations.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>23. Have any animals been vaccinated or immunized in the past year?</p> <p>If <u>Yes</u>, give:</p> <p>A. Kinds of biologics used.      B. Animals and number to whom administered.      C. Administered by.</p>	<p>1. Yes</p>	<p>2. No</p>

24. Are the premises located  
near a zoo?

1. Yes

2. No

If Yes, identify.

Laboratory Samples Submitted

Kind of Animal	Serum	Tissue and OP (Describe)
	A	B
25. Cattle		
26. Horses		
27. Swine		
28. Sheep		
29. Goat		
30. Other (specify)		

State Code		County Code		Accession Number		Date Received by Laboratory		Type of Specimen		Gonfidence of Specimen		Animal SpecieS		Virus Isolation		Bacteriology and Toxicology		AniMAL Toxcology		Inoculation		Ecology Study		for other SpecieS					
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
				</																									

87. Classify the premises as:

1. Standing water--swampy, ponds, lakes
2. Flowing water--irrigation, canals, rivers
3. Sprinkle irrigation--no surface water within 1/2 mile
4. Recent flooding
5. Mountain streams and forest
6. No information

88. Classify the terrain as:

1. Bottomland
2. Valley
3. Plain
4. Plateau
5. Rolling hills
6. Mountains
7. Other (specify)

89. Identify the vegetation and trees and their location with respect to topography of the premises as related to disease.

90. Give elevation of premises in feet.

91. Give total acreage of premises.

92. Give approximate acreage allocations in:

1. Pasture (identify the vegetation)
2. Cropland (name the crops)
3. Forage (identify types)
4. Exercise yards, feedlots, corrals.
5. Other (specify)

93. Is Drainage-- 1. To other farms? 2. From other farms?	
94. Are premises on a hillside or slope? If Yes, in which direction does the slope face?	1. Yes      2. No
95. What is the direction of prevailing winds?	
96. Is the soil characteristically 1. Clay 2. Sandy 3. Rocky 4. Tillable fertile 5. Alluvial (clay mud, silt deposited by running water) 6. Muck 7. Other (describe)	
97. Do the fields or buildings occupied by the infected animals adjoin a highway or body of water?	
98. Does a footpath or public right of way traverse the premises?	
99. Identify sources of water supply for animals: 1. In the barns 2. In the pastures	
100. Which arthropods are most prevalent?	

101. Are rats and mice--

1. Plentiful?
2. Moderate?
3. Few?

102. List wildlife evident or known to be present, such as:

1. Ground hogs
2. Wild birds (identify)
3. Wild waterfowl (identify)
4. Deer
5. Other

103. Should samples of arthropods, wildlife, wild birds, wild waterfowl, and plants be collected for study?

104. Give average temperatures by weeks for past 3 to 4 months. Indicate periods of unusual drought, heat, cold, rain, or snow.

105. Indicate days since last significant rain.

1. Freq. for 2 to 3 weeks
2. 1 to 7 days
3. 8 to 14 days
4. 15 to 21 days
5. 22 to 30 days
6. Flooding within 30 days
7. No information

106. Indicate type of herd management used:

1. Pasture during daytime only.
2. Pasture during nighttime only.
3. Pasture day and night.
4. Pasture and hay.
5. Confined to barn and dry lot.
6. Confined to barn.
7. Other (identify)
8. No information

107. Identify management associated with feed regimen:

1. Rank brushy pasture.
2. Scanty pasture.
3. Rank pasture and hay.
4. Scanty pasture and hay.
5. Very new hay.
6. Confined--dry feed only.
7. Confined--hay and chopped green feed.
8. Other (identify)
9. No information.

108. Identify source of feed used:

- A. Raised on farm
- B. Mixed on farm
- C. Mixed at mill
 

If Yes, give name and location.
- D. Purchased from mill or feed store.
 

If Yes, give name, location, and dates of purchases in last 6 months.

1. Yes	2. No

109. Do animals feed from hay or straw on the ground, in yards, or in corrals?

110. How is feed stored and provided?

111. Are concentrates obtained in bags or bulk?

112. Are hay, straw, or litter purchased?

1. From whom?
2. When?
3. How delivered?

1. Yes	2. No
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<p>113. Has litter, hay, straw, or manure moved off the premises in the last 6 months? If Yes, give name and location of consignee.</p>	1. Yes	2. No
<p>114. Describe handling of bags and sacks containing feed and fertilizers.</p>		
<p>115. What is the use and disposition of manure: A. Spread on fields B. Used on garden C. Hauled off premises (If so, indicate how, when, and to whom.)</p>		
<p>116. Is manure brought onto the premises? If <u>Yes</u>, indicate source and location, use and method of transport.</p>	1. Yes	2. No
<p>117. Does liquid manure drain onto highways, into common bodies of water, or onto adjoining premises? (Describe)</p>	1. Yes	2. No
<p>118. Are animal wastes and feed handled at all times with separate equipment maintained for that specific purpose?</p>	1. Yes	2. No
<p>119. What is the disposition of garbage wastes?</p>		
<p>120. Is household refuse or garbage fed to animals? (Explain)</p>	1. Yes	2. No

<p>121. Is garbage brought onto the premises for animal feeding?      If <u>Yes</u>,      A. What are its contents?      B. What is its source?      (Name and location)      C. Is it cooked according to State and Federal regulations?</p>	<p>1. Yes</p>	<p>2. No</p>
<p>122. Are there any garbage or refuse dumps in the vicinity?      If <u>Yes</u>, give locations and mileage from premises.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>123. Describe sources and quality of water supply in barns, buildings, and pastures.</p>		
<p>124. How and by whom is milk collected?</p>		
<p>125. Is skim milk, whey, or milk products purchased for animal feeding?      If <u>Yes</u>, indicate source of supply and method of transport.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>126. Have any members of the family, employees, or members of their families, or neighbors visited a foreign country within the last year?      If <u>Yes</u>,      A. Name the country or countries and dates.      B. Indicate whether they brought back any articles (Specify) and indicate their disposition.</p>	<p>1. Yes</p>	<p>2. No</p>

<p>127. Have any foreign residents visited the family, employees and their families, or neighbors within the past year?</p> <p>A. Identify country or countries of origin and dates of visit.</p> <p>B. Indicate whether visitors brought meat or meat products with them. (Explain)</p> <p>C. Identify the persons visited.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>128. Have any members of the family, employees or their families, or neighbors received food from a foreign country within the past year?</p> <p>If <u>Yes</u>,</p> <p>A. Identify the person and date.</p> <p>B. Identify the food and explain its disposition.</p> <p>C. Verify with local postal authorities.</p> <p>D. Identify country of origin.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>129. Has any machinery or farm equipment been imported for use on the premises?</p> <p>If <u>Yes</u>,</p> <p>A. Indicate country of origin and date of acquisition.</p> <p>B. Describe manner of disposal of crates, cartons, and packing materials.</p>	<p>1. Yes</p>	<p>2. No</p>
<p>130. Is machinery or equipment used on other premises or borrowed from other premises?</p> <p>A. Identify equipment or machinery.</p> <p>B. Give dates of use within past year.</p> <p>C. Identify the premises.</p>	<p>1. Yes</p>	<p>2. No</p>

<p>131. Are any members of the family or of the employees families employeed off the farm. If <u>Yes</u>, indicate if it is:</p> <ul style="list-style-type: none"> <li>A. On another farm.</li> <li>B. In a slaughter house.</li> <li>C. In a rendering plant.</li> <li>D. In a stockyard or auction market.</li> <li>E. In a dairy.</li> <li>F. In a feed mill.</li> <li>G. In a meat market.</li> <li>H. Other (specify).</li> </ul>	<p>1. Yes</p>	<p>2. No</p>
<p>132. List members of family or employees and their families exposed to animal operations. Identify the operation(s) as:</p> <ul style="list-style-type: none"> <li>A. Feeding.</li> <li>B. Milking.</li> <li>C. Cleaning barns and lots.</li> <li>D. Mixing feed.</li> <li>E. Treating diseased animals.</li> <li>F. Delivering calves and removing afterbirth.</li> </ul>		
<p>133. List names, locations, and dates of visits within the past 3-4 months of:</p> <ul style="list-style-type: none"> <li>A. Livestock dealers.</li> <li>B. Salesmen.</li> <li>C. Equipment repairmen.</li> <li>D. Feed deliverymen.</li> <li>E. Neighbors.</li> <li>F. Others (specify).</li> </ul>		
<p>134. Is artificial insemination used? If <u>Yes</u>,</p> <ul style="list-style-type: none"> <li>A. Give name and location of association.</li> <li>B. Identify animal(s) inseminated in past 6 months.</li> <li>C. Give name of inseminator(s).</li> </ul>	<p>1. Yes</p>	<p>2. No</p>

135. Have the services of a veterinarian been used for any reason within the past year?  
If Yes,  
A. Identify by name and location.  
B. Reason for the visit(s).  
C. Result of the visit.

1. Yes

2. No







## SECTION III--SURVIVAL OF FOOT-AND-MOUTH DISEASE VIRUS

Location	Period of Survival	Conditions
Inside barns	15-28 days	AT,* summer
On walls, etc.	35-68 days	AT, winter
Outside buildings	9-15 days	AT, summer
On walls, etc.	52-79 days	AT, winter
Walls, plaster	27 days	AT, summer
Brick	14 days	AT, summer
Abattoir waste	3 days	68° F.
Sewage	Over 100 days	36-45° F.
Fresh water	At least 30 days	AT, about 34° F.
Salt water	Over 100 days	AT, summer
Manure, liquid	39 days	AT, autumn open tank
	16 hours	closed tank
Manure, solid	29-33 days	AT, summer
	156-168 days	AT, winter
	6-9 days	Depth 30 cm. in pit
Carden soil	25-30 days	AT, summer
Soil surface	6-7 days	AT, summer
	136-146 days	AT, winter
Corrals	345 days	AT, one instance
Barn mud	70 days	AT, summer
Dry sand, deep	11 days	AT
Dry sand, surface	2-3 days	AT
Hay, on surface	1-10 days	AT
Hay, inside stack	30 days	AT, summer
	185-200 days	AT, winter
Hay, fodder	56-105 days	AT
Barn, fodder	140 days	AT
Straw, flour meal	5-49 days	AT
In pasture plants	1-7 days	AT, summer
	52 days	AT, winter
Mountain pastures	26 days	AT, summer
	258 days	AT, winter
Saliva	1 day	98.6° F.
	24 days	73° F.
	35 days	41° F.
Urine, bovine	5 hours	AT, ph 6.8-7.6
<u>Animal Products</u>		
Blood, citrated	5 days	98.6° F.
	10 days	AT
<u>Clothing</u>		
Gum boots	102 days	AT
Cotton cloth	63-68 days	AT
Silk, linen	3-14 days	AT
Leather (shoes)	30-35 days	AT

\*Ambient Temperature

Location	Period of Survival	Conditions
<u>Dried Blood</u>		
On glass, brick, wood	2-3 days	AT
In meat wrappers	45 days	AT
<u>Hides</u>		
Green	90 days	59° F.
	352 days	39° F.
Dried	42 days	68° F.
Salted	46 days	AT
Cowhair (live)	28-42 days	AT, winter
<u>Milk and Milk Products</u>		
Milk, whole fresh	25 hours	AT
untreated	12 days	41° F.
Milk, skim	30 hours	AT
Butter, unsalted	8 days	AT, after precooling
	26 hours	AT, no precooling
Butter, salted	9 days	AT, after precooling
	4 days	AT, no precooling
Cream, butter	45 days, even when rancid	AT
Buttermilk, skim milk, etc.	Less than 20 hours, viability depends on pH (acidity)	AT, pH is about 6
Cheese	5-22 hours depending on souring, heating	
<u>Dried Milk Powder</u>		
Moisture 6 percent	2 years	AT
7 percent	1 1/2 years	AT
Milk, dried on wood	2 days	AT
<u>Meat Products</u>		
Pork flesh	4-6 days	AT
Kidney	10 days	AT
Bovine Carcass meat	73 days	39° F.
	194 days	32+° F.
Human Respiratory Track	24 hours	Normal Body Temp.





## SECTION IV--GUIDELINES FOR ESTABLISHING FIELD UNIT

1. Definition of a Field Unit

A field unit is that part of an eradication organization assigned responsibilities for a specific geographical area by the READEO field operations officer during an eradication program.

The size of a field unit will depend upon livestock density, type of roads, weather conditions, number of personnel available for assignment, and geographical boundaries. It is recommended that for an actively infected area the average field unit covers approximately 40 miles by 40 miles. Travel time should be no more than half an hour from the headquarters to the most distant premises. When infection is limited or livestock density is sparse, larger areas may be covered.

2. Guidelines for Field Unit Veterinary Supervisor Establishing and Operating a Field Unit

a. When selecting the unit site location, select a town that can provide accommodations for personnel and equipment and is close to known infection.

b. For temporary accommodations, rent rooms in a motel or hotel; one or more rooms should be used as the office. The number of other rooms reserved will depend upon the number of personnel expected to arrive within the next 48 hours. Consideration in selecting the accommodations must include parking space; space for equipment, vehicles, supplies, and communications; and eating facilities. It should not be located where traffic will be a problem. Call the READEO immediately and give them the telephone number of the field unit officer.

c. Obtain additional telephone service as needed.

d. Maps of the area should be obtained immediately and posted in the office. Road maps should be obtained and one posted in the office and others made available to field personnel. The infected premises and quarantine areas should be outlined. Aerial photo maps may be available from Soil Conservation Service (SCS) or Agricultural Stabilization and Conservation Service (ASCS).

e. Notify local authorities, police, county sheriff, county agent, ASCS, local veterinary practitioners, an USDA County Defense Board. Establish temporary security on the infected premises until the quarantine and C&D officer or the emergency guard officer arrives.

f. When approached by news media personnel, respond honestly and directly to all questions for which you have firsthand knowledge. Always tell the truth but do not volunteer opinions. All other questions should be referred to the information officer assigned who can direct them to the best possible source of up-to-date information. State and Federal Freedom of Information Acts often provide media personnel access to much information held by government agencies,

but extreme care must be exercised to make sure no information is disclosed that might be in violation of the privacy act.

g. Establish communications with the infected premises.

h. List personnel who are on their way and plan assignments for each person that does not already have a specific assignment. This will enable them to be put to work immediately upon arrival.

i. Make specific assignments as personnel arrive. If all the above items have not been completed, personnel arriving should assist temporarily, regardless of previous assignment, until all items have been completed.

j. Additional personnel needs should be anticipated to the maximum extent possible on a daily and weekly basis and requests for these personnel should be made as far in advance as possible.

k. Make a daily report at 6 p.m. each day to the READEO headquarters. The Daily Report format and instructions are included in Section I, Part U.

### 3. Documentation of the Program

In the heat of a campaign, when attention is focused on the minute-to-minute business of eradicating the disease, the long-term record of the campaign is apt to be forgotten. Some things, unless they are written at the time, cannot be correctly recalled later, and many valuable details may be lost which would have been of great help to the program historian. An accurate history is of considerable value in forming policies and plans for future disease eradication programs and in the event of litigation.

a. Dating documents. Chronology is all-important to the historian. Every document used in the program should be dated and time given when possible. This is important not only for history but for day-to-day administration.

b. Daily diary. The best chronological record--and one which can be used to correct occasional lapses in the dating of documents--is a daily diary. The Field Unit Veterinary Supervisor should keep one, or see that one is kept, giving as fully as possible the events of the day. To the historian and in case of litigation, this can easily be the most valuable document of the program. Confidential matters may be made a part of the diary. While keeping some matters in confidence is highly important at the time, it is surprising how quickly the need for confidential classification runs out.

c. Maps. Maps showing the spread of the disease should be made, dated, and filed each week. Not only do they have current value but they provide a valuable record program progress.

d. Photos. All photographs should be kept in a permanent file with a complete and accurate caption, including the date taken and the location of the site in the picture.

e. Clippings. A file of clippings is an aid to the historian--but only if they are dated and bear the name of the journal or newspaper on each one. A clipping without date and source is useless.

#### 4. Guideline for Administrative Officer

The job of supply and vehicle officer may be combined with duties of administrative officer in a small operation. The duties of an Administrative Office are to--

Develop and initiate office procedures at the field unit headquarters in cooperation with the Administrative Officer at the READEO headquarters.

Obtain office space, personnel supplies, and equipment necessary for the administrative and operational functions of the field unit.

Prepare all personnel and fiscal reports as required.

Prepare a budget.

Establish a file system for all reports.

#### 5. Guideline for Diagnosis and Inspection Officer

The duties of the Diagnosis and Inspection Officer are to--

Coordinate with the Field Unit Veterinary Supervisor, Quarantine Officer, and others to define and recommend in planning quarantine boundaries.

Subdivide each inspection sector into work units; that is, quarantine zone sections Q<sub>1</sub>, Q<sub>2</sub>, etc.

Assign an inspector to each work unit and make a chart of assignments. Order inspectors to report immediately all suspicious cases found during inspection.

Keep a list of available qualified diagnosticians to investigate suspicious reports.

Develop information releases with the Information Officer for radio, television, and press to advise livestock owners to report to the Field Unit any suspicious animals; give telephone number in release.

Develop tracing procedures on all exposed animals and plot projected spread of the disease on a map.

Confer with diagnostician when he calls in the telephone report and give permission to report the case to the READEO headquarters, or send another diagnostician to give a second opinion on the case.

Upon confirmation of cases, alert all other sections of the field unit.

Establish briefing sessions for diagnosis and inspection personnel; explain use of USDA-State appraisal forms where necessary, telephone report, negative case report, State Quarantine form, and any other special forms peculiar to that State.

Develop procedures for collecting specimens and transmitting them to the laboratory.

Establish filing system for diagnosis and inspection reports and forms.

Establish procedures for testing of premises in accordance with Section I, Part J--Testing of Premises.

Refer to Section I, Part A--Investigation; Part B--Diagnosis; and Part C--Quarantine. For additional information, the guideline for veterinarians assigned to investigate reported suspicious cases is to be found in Section I, Part K--Procedures on an Infected Premises.

## 6. Guideline for Supply Officer

In a small operation the duties of a Supply Officer may be included in the duties of the Administrative Assistant.

### a. General supplies. The Supply Officer--

Cooperates with the Administrative Assistant and the Diagnosis and Inspection Officer to develop lists of immediate and anticipated supply needs; that is, coveralls, rubber boots, pants and coats, brushes, handtools, pumps, etc.

Arranges for commercial overnight laundering service for coveralls.

### b. Vehicles. The Supply Officer--

Determines number and type of vehicles needed.

Determine source of vehicles; that is, GSA, rental company, military, or personal. When possible, vehicles that will be used by diagnosis and inspection personnel should be of a type readily cleaned both inside and outside.

Plans maintenance and storage of vehicles. Determines adequacy of local garage to handle repairs and servicing or establishes a repair shop.

Establishes a system for routinely washing and cleaning and disinfecting vehicles.

Plan for emergency road service.

### c. Procedures. The Supply Officer--

Sets up procedures for issuing equipment and providing for its accountability.

7. Guideline for regulation enforcement, security, disposal, and C&D officer

In a small operation, the duties of regulation enforcement, security, disposal, and C&D may be combined.

a. Assists the Field Unit Veterinary Supervisor and the Diagnosis and Inspection Officer in planning and establishing quarantined area.

Posts disease warning signs on all roads at the outer perimeters of the quarantined area.

Establishes patrols to cover all roads in quarantined area on a 24-hour basis to control movement of animals, animal products, animal feeds, or other farm products. May use State patrol, National Guard, sheriff, or other personnel for such patrols.

Establishes list of all dairy processing plants that have received or are receiving milk or milk products from the quarantined area. Arranges for inspectors to visit and establish procedures (Section I, Part C--Activating READEO's and Quarantining, par. 9, Recommended Procedures for Control of Movement and Disposition of Milk and Milk Products During FMD Disease Outbreak).

At the discretion of the Field Unit Veterinary Supervisor, the movement of perishable crops; that is, truck garden products for human consumption, commercial poultry and eggs, and other nonlivestock products from the infected farm after depopulation and after the contaminated portion of the premises has been thoroughly soaked with a permitted disinfectant may be allowed on a permit basis. No livestock feeds will be permitted off an infected premises until testing and restocking procedures have been completed.

Allows movement of other farm products only on permit basis such as livestock feeds and straw on not-known-to-be-infected farms in the quarantine area.

b. The officer in charge of the Guard Detail will cooperate with the Field Unit Veterinary Supervisor and the Quarantine C&D Officer in planning the number and location of guards and road patrols in the quarantine area.

Post guards around the clock on infected premises until depopulation is completed and the contaminated portions of the premises thoroughly soaked with an approved disinfectant. Lock all other gates and post notices. Security will then be the responsibility of the C&D team officer.

Obtain personnel for guard and patrol duty from State Patrol Units, Sheriffs' offices, City Police forces, National Guard units, or hire them from other sources in sufficient numbers to maintain strict quarantine security. All regulation enforcement and security must keep accurate records of all pertinent actions, observations, and discussions. These may be critical for litigation.

Issue instructions for guards on the infected premises and on patrols as per Section I, Part C, par. 6, Quarantine Area Security.

c. The Disposal and Heavy Equipment Officer confers with Field Unit Veterinary Supervisor and Supply Officer on expected needs for heavy equipment and for materials to be used in burning carcasses.

Locates all available heavy equipment in the area; that is, county and State road units, local contractors, heavy equipment dealers, and farm implement dealers.

Locates an area to set up storage and maintenance of equipment. This may be at the State-County road maintenance depot or other suitable area.

Establishes recordkeeping system on all equipment.

Transmits lists of equipment or materials not available locally to the supply officer for immediate referral to the primary headquarters.

Establishes disposal teams consisting of riflemen and sufficient labor to handle the animals and slash the carcasses. Guns and ammunition will be provided by the Supply Officer or by the persons doing the depopulating to qualified personnel. The disposal and heavy equipment officer communicates with local authorities regarding personnel that could be assigned as riflemen.

Depopulation must be under the supervision of a veterinarian to assure the use of humane methods. Coveralls, rubber boots, rubber hats, and rubber gloves must be provided each team member. Upon leaving an infected premises, the members will put on clean coveralls and leave the dirty ones behind. Rubber gear must be thoroughly cleaned and disinfected under supervision before leaving.

Refer to Section I, Part G--Disposal, for additional information.

d. Establishes and trains sufficient C&D teams to clean and disinfect the infected premises assigned to the field unit.

Assigns trucks with high pressure pumps and tanks mounted on them (or proportioners) for use at the entrances or exits of infected premises to C&D delivery trucks, heavy equipment, portable corrals, or other items permitted off the premises.

Locates an area where facilities can be established to clean and disinfect all vehicles, heavy equipment, and other miscellaneous items used by the field unit. Every vehicle and piece of equipment should be cleaned and disinfected again even though it was originally done at the farm exit. Adequate water supply, an impervious surface, and good drainage must be considered in site selection.

In conjunction with the Vector Control Officer, determines availability of State or local insect and rodent control agencies and arranges for their services.

Refer to Section I, Part I--Cleaning and Disinfection, for additional information.

#### 8. Guideline for Appraisal and Marketing Officer

The duties of the Appraisal and Marketing Officer are to locate personnel in the area who are qualified to act as appraisers and arrange to secure their services through direct hire or by contract. Consideration must be given to representation from industry, the State, and the Federal Government.

Establish teams of appraisers. The number of teams needed will depend upon the size of the outbreak. The primary headquarters should be advised of personnel requirements that cannot be satisfied locally. A basic appraisal team will consist of one industry representative, one State representative, and one Federal representative. The State and Federal Governments may be represented by one Federal VS employee provided both parties agree; however, a team must never be less than two persons. All appraisals should be under the direct supervision of READEO appraisal to ensure uniformity.

##### Responsibilities of READEO Appraisers

Make necessary arrangements to comply with requests for special appraisers for purebred animals and contested appraisals.

Establish a record system for handling appraisal forms, which will provide an audit of appraisals and will assure rapid payment of indemnities.

Determine what local products will be affected by the quarantine and what appraisals will be needed to compensate for additional costs of handling or destruction; for example, milk, fresh vegetables.

Develop and maintain daily market quotations for market classes of livestock to be used when applicable to arrive at appraisal value of livestock and products.

#### 9. Guideline for the Information Assistant

The duties of the Information Assistant are to establish an office clearly recognizable as an information source for the Field Unit.

Compile a list of local news outlets (radio, TV, newspapers) from the local telephone directory.

Have ready for newsmen pertinent publications, background materials, and photographs.

Coordinate interviews and assure that media personnel adhere to all security policies and procedures.

Requests for information under the Freedom of Information Act and news releases shall be approved by the READEO Director.







## SECTION V--WILDLIFE

1. Information and Organizations

There are four basic organizations representing the wildlife resources in the United States.

a. Federal organization. The Federal Government is represented by the Bureau of Sport Fisheries and Wildlife of the Fish and Wildlife Service of the Department of the Interior. The Fish and Wildlife Service is divided into five regions. Each region has the responsibility for regulating migratory birds, animals, and fish, such as caribou, doves, ducks, geese, and salmon. Under the Pitman-Robinson and Dingle-Johnson Acts, the Bureau coordinates research and development with the State Game and Fish Agencies.

b. State organizations. Each State has an official agency to represent game and fish interests, such as New York State Conservation Department, West Virginia Department of Natural Resources, or the Georgia Game and Fish Commission. The State Agencies are primarily responsible for management of nonmigratory wild animals, birds, and fish, such as deer, elk, pheasants, quail, bass, and bluegills.

In general, the State game and fish agencies are divided into at least three major areas of endeavor: (1) management and development, (2) enforcement, and (3) information and education.

c. Regional organizations. Regional associations of Game and Fish Commissioners have been formed in five regions of the United States which parallel the five regions of the U.S. Fish and Wildlife Service. The regional associations coordinate and promote development and conservation of wildlife resources in their respective regions. A president is elected annually for each regional wildlife association.

d. International organizations. The International Association of Game, Fish, and Conservation Commissioners is made up of representatives from Canada, Mexico, Puerto Rico, and the United States. The director of each State agency is the official representative to the international organization and the presidents of the regional associations usually act as a governing body for the international association.

2. Foot-and-Mouth Disease Eradication in Wildlife

a. Wildlife unit organization. Foot-and-Mouth Disease eradication activities for wildlife will be carried out through the formation of a wildlife unit or units within the State. The State Game Conservation Commissioner will appoint a State Wildlife Emergency Disease Officer. It will be the responsibility of this officer to establish the wildlife unit. The wildlife unit should be headed by a game biologist and a READEO cooperating veterinarian. They will be responsible for coordinating efforts to survey, control, and depopulate a specified game animal in a given area and maintaining liaison with

READEO field units in the area. The wildlife unit will be activated each time foot-and-mouth disease is confirmed in wild or domestic animals and there is a probability of its spread to wildlife in the area. Following is a proposed organization chart for the wildlife unit.

## PROPOSED ORGANIZATIONAL CHART FOR THE WILDLIFE UNIT

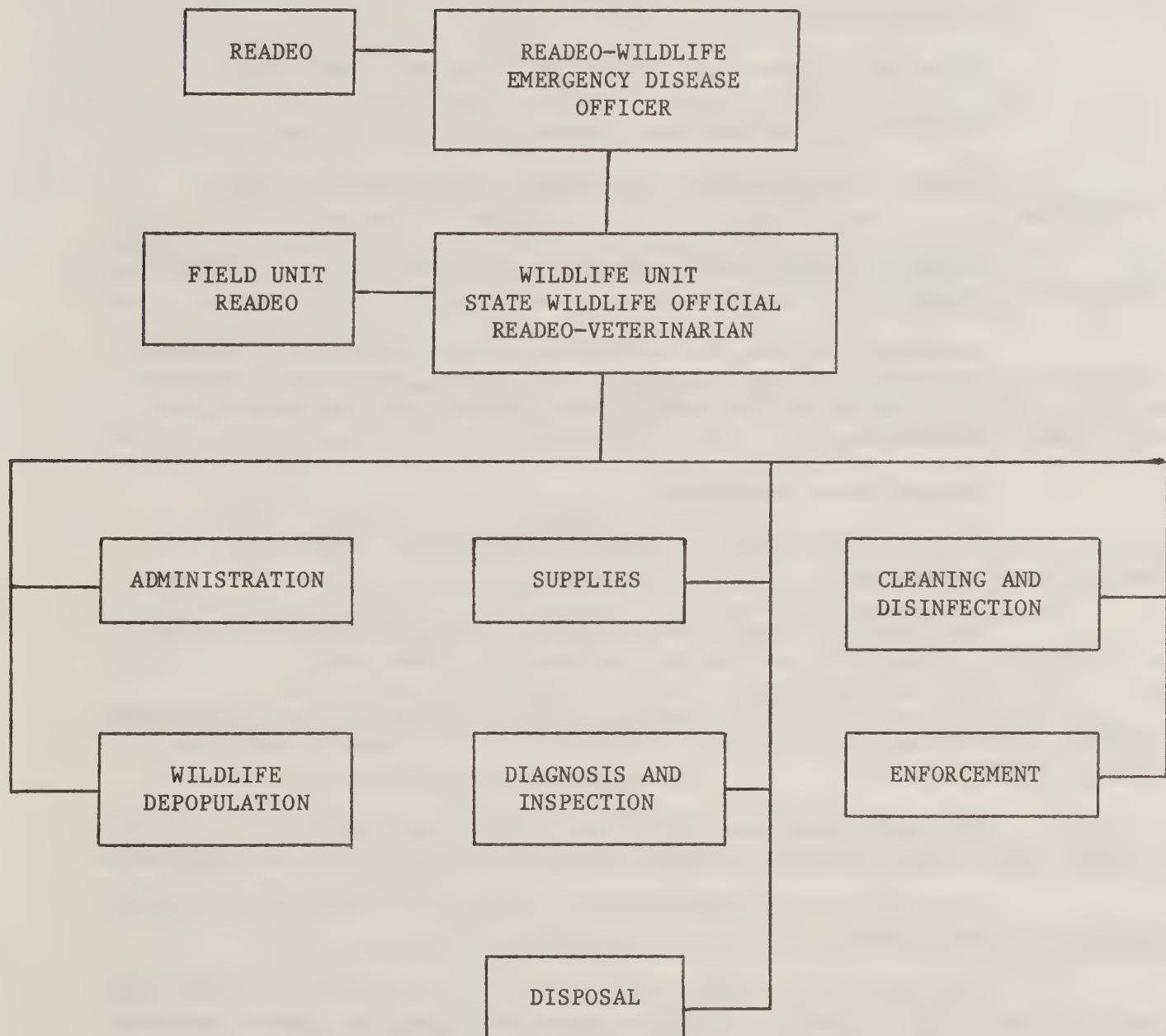


Figure 5

b. Wildlife unit operations. The procedure of the Wildlife Unit and the supplies it will require are as follows:

(1) Initial actions:

Establish liaison with READEO field units in the area.

Establish a headquarters office.

Contact local wildlife enforcement officers and wildlife biologists.

Review maps with local personnel and determine general area to be included in the quarantine area.

Determine the need for personnel for administration, diagnosis, depopulation, disposal, and enforcement. The size of the area, topography, wildlife density, and methods of control and disposal will influence the personnel requirements.

(2) Depopulation procedures:

A conservation officer should be selected to supervise depopulation activities.

The point of known infection should be established on the map-aerial photos and will be used in conjunction with other maps..

The quarantine area boundary line should be reviewed to determine specific points (such as known deer trails) which will need concentrated control efforts.

The quarantine area should be divided into sectors (approximately 20 square miles) and depopulation personnel assigned as they become available.

Depopulation personnel should be assigned according to method of depopulation being used:

Still hunting in areas inaccessible to vehicle will require one map per square mile; however, it may be necessary to deploy control personnel on a more conservative basis. Under such circumstances, one man will be assigned 4 square miles or more and he will be responsible for selecting his hunting area each time he goes out. Local personnel will be more effective for this method of hunting.

Night-lighting will require a crew of three men (a driver, light-man, and rifleman). Their activities will be confined to areas with roads. A crew should be able to cover 25 to 50 miles of roads during one hunt, depending upon time of year, terrain, and game density. The crew should be provided means to transport carcasses back to a central area for disposal.

An aerial photograph of each sector plus the information provided by local personnel will be invaluable in determining the number of control personnel needed per sector. Figures 6 and 7 illustrate a wildlife quarantine zone, and the sectors into which each is divided.

(3) Supplies:

Administration supplies: General office supplies, typewriter, duplicating machine, desk and chairs, maps, and visuals.

Wildlife control or depopulation supplies: Trail motorcycle, trucks, autos, jeeps, helicopters, other appropriate vehicles, horses and trailers, planes, boats, guns and ammunition (personal weapons may be used), specimen containers and collection equipment (scissors, knife, gloves), lights (spot and portable headlamps), field rations, insect repellent, snake bite kit, and first aid kits.

General supplies and equipment: Generators, housing facilities (portable tents and sleeping bags), disinfectants, spare parts for all equipment, radio system, gasoline and oil, and heavy equipment where necessary, bulldozers, etc.

(4) Inspection and diagnosis procedures:

At least one veterinarian familiar with the disease and one wildlife biologist should be assigned to inspect carcasses and collect diagnostic specimens (tissue and blood).

A portable laboratory unit for collecting and preserving specimens and technician may be necessary if the operation is in an accessible area.

(5) Carcass disposal procedures:

Disposal will not be attempted in inaccessible areas or will be on a limited basis. For instructions on burning and burial procedures, refer to Section I, Part G--Disposal.

When carcasses are accessible, disposal will be at a central point by burning or burial.

Heavy equipment should be available for use when indicated.

(6) Cleaning and disinfection procedures (see part I--C&D):

Equipment, personnel, etc., leaving quarantine zones (that is guns, vehicles, bulldozers) must be cleaned and disinfected.

Ethylene Oxide may be used as a fumigant on corrosive sensitive equipment, such as guns, scopes, and binoculars.

Soda ash or NaOH will be used to disinfect all other equipment. Clothing may be removed in sealed containers for washing or dry cleaning. Contaminated work clothes should be soaked in 4 percent soda ash before removal from the quarantine zones.

A complete clothing change will be necessary for all personnel leaving the quarantine zones. Rubber gear will not be required for wildlife depopulation personnel.

A shower will be mandatory whenever practical for all personnel leaving the area.

(7) Enforcement procedures:

Enforcement of quarantine regulations will be under the supervision of the State Game Conservation Officer.

All enforcement activities will be coordinated with the READEO Field Unit Veterinary Supervisor.

Enforcement measures should include isolation of quarantined areas using roadblocks and patrols. Aerial vehicle, horseback, and boat patrols may be used.

Cleaning and disinfection of equipment and personnel will be under the control of the enforcement officer.

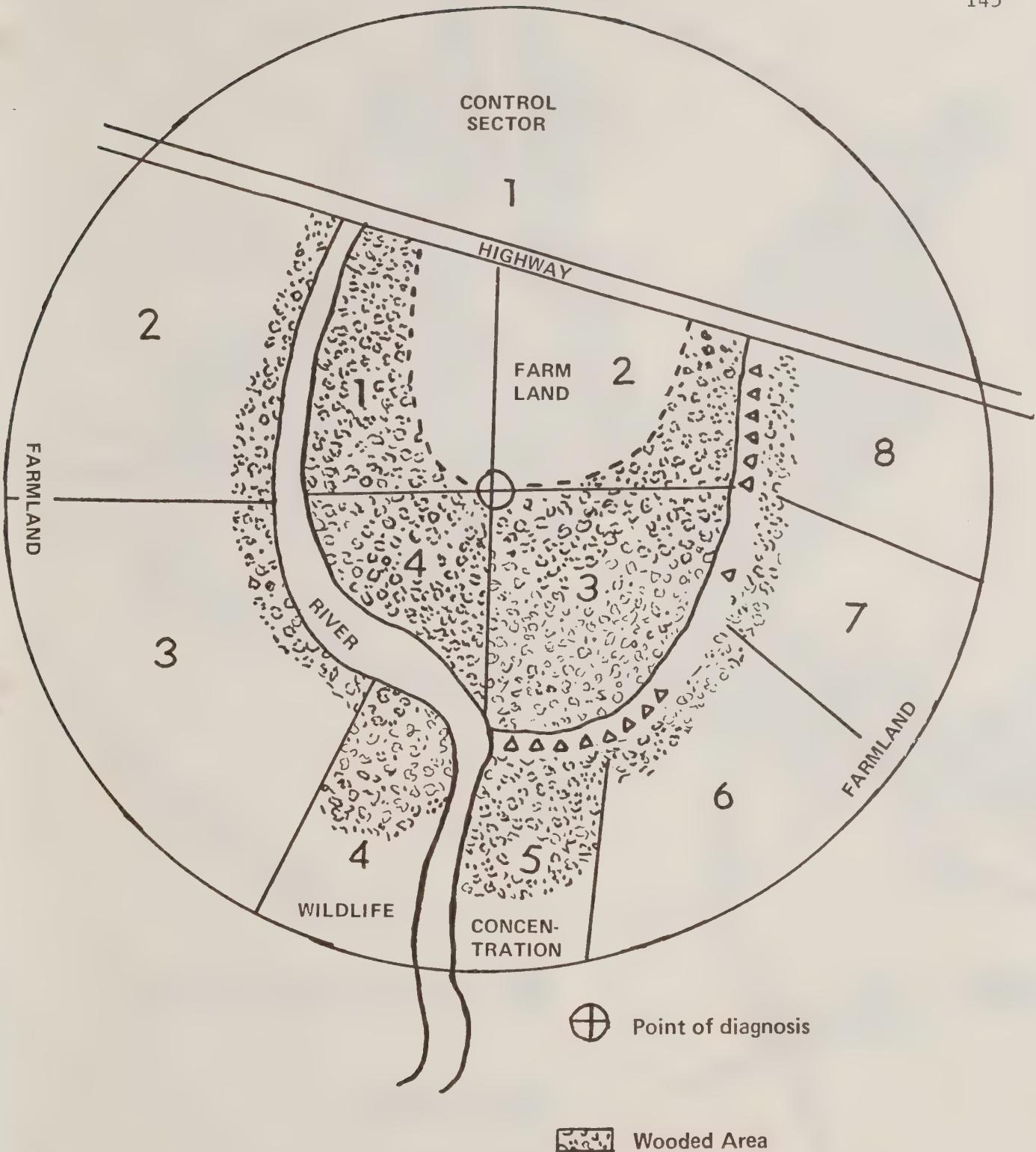


Figure 6.-Wildlife Quarantine in Farmland Area Where Livestock and Wildlife Intermingle

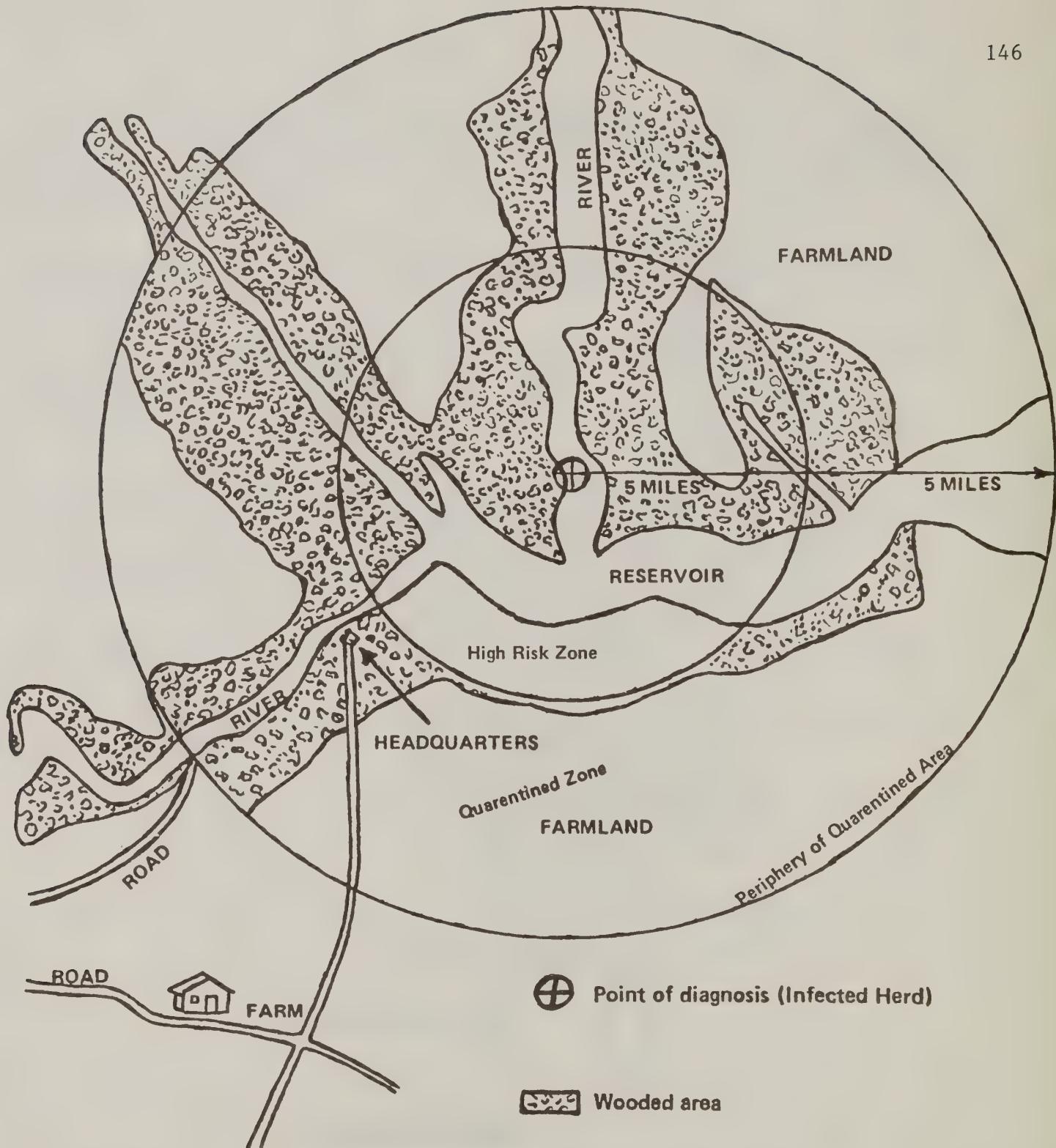


Figure 7. - Wildlife Quarantine in a Wilderness Area





## SECTION VI--DEFINITIONS

Contact Premises. Premises such as: (1) premises (not known to contain infected animals) where animals are separated only by a fence from animals on an infected premises; (2) premises that have received direct shipments of animals from infected premises; (3) premises on which the animals have had direct contact with persons who have handled infected animals; and (4) premises on which the animals have had direct contact with products of or materials exposed to infected animals.

Emergency Programs. That part of Veterinary Services which has the responsibility for controlling and eradicating emergency animal diseases.

Emergency Animal Disease. Foot-and-mouth disease, rinderpest, contagious bovine pleuropneumonia, or any other communicable disease of livestock or poultry which in the opinion of the Secretary constitutes an emergency and threatens the livestock or poultry of the country.

Director, Regional Emergency Animal Disease Eradication Organization.

Title of the veterinarian responsible for supervision of the READEO.

Field Unit Veterinary Supervisor. Veterinarian responsible for directing field unit who reports to field operations officer of READEO.

Indirect Contacts. Contacts of the type occurring when persons, farm products, farm equipment, milk trucks, and feed trucks visit other premises after leaving an infected premises.

Infected Premises. Premises on which foot-and-mouth disease exists or has been known to exist and on which eradication procedures have not progressed far enough for the premises to be declared free of infection.

Milk Marketing Control Zone. That geographical area covered by a Federal Milk Marketing Order Issued by the Dairy Division of the Consumer and Marketing Service.

Moratorium. The legal authorization to delay action for a given period of time. Example: Stop the movement of all livestock.

Quarantine Area. Geographical area covering the quarantine zone and the high-risk zone.

a. High-risk zone--the geographical area extending 3-5 miles beyond all known infected herds.

b. Quarantine zone--the geographical area extending from the periphery of the high-risk zone to the outer perimeter of the quarantined area.

Permitted Disinfectant. A disinfectant approved by Veterinary Services for use against foot-and-mouth disease.

Regional Emergency Animal Disease Eradication Organization (READEO). One of five predesignated task force groups who will assemble to eradicate FMD upon confirmation.

Secretary. The Secretary of Agriculture of the United States or any officer or employee of the Department to whom authority has heretofore been delegated, or to whom authority may hereafter be delegated to act in his stead.

State Livestock Health Official. The State employee, such as the State Veterinarian, who is in charge of each State's regulatory activities concerning livestock health.

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